M E M O R A N D U M

TO: Interested Parties/Applicant

FROM: Paul Dubenetzky, Chief
Permits Branch, Office of Air Management

DATE: January 10, 2001

SUBJECT: Notice of PSD Permit Decision for:

Steel Dynamics, Inc.
2601 County Road 700 East
Columbia City, (Whitley County) Indiana 46725
Permit Number: 183-12692-00030

Please be advised that on behalf of the Commissioner of the Department of Environmental Management (IDEM), I have issued a decision on the enclosed Prevention of Significant Deterioration (PSD) Permit. Pursuant to IC 13-15-5-3 and federal requirements codified at 40 CFR Part 124.15(b), this permit is effective thirty (30) days after the service of this notice. This permit may be revoked or modified in accordance with the provisions of IC 13-15-7-1. I have attached a copy of the final permit and related documents for your information. This material may be downloaded from the internet at: http://www.epa.gov/ARD-R5/permits/inonline.htm.

This PSD permit was issued by IDEM under federal law pursuant to a delegation agreement with the United States Environmental Protection Agency as set forth by 40 C.F.R.§ 52.21(u).

If you wish to challenge this decision, 40 CFR 124.19 requires that you petition the Environmental Appeals Board within thirty-three (33) calendar days from the mailing of this notice, at the following address:

Environmental Appeals Board MC 1103B
U.S. EPA
Ariel Rios Building
1200 North Pennsylvania Avenue, NW
Washington, D.C. 20460

Pursuant to 40 CFR Part 124.19, the petition must include a statement of the reasons supporting review, including a demonstration that any issues being raised were raised during the public comment period. When appropriate, the petition must also include a showing that the permit condition in question is based on:

(1) a finding of fact or conclusion of law which is clearly erroneous, or;
(2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review.

Pursuant to 40 CFR Part 124.19, the Environmental Appeals Board shall provide public notice of any grant or review. Notice of denial or review shall be sent only to the person(s) requesting review.

(Over)

If you wish to challenge this decision pursuant to Indiana law, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review within eighteen (18) calendar days from the mailing of this notice. Your petition describing your intent must be submitted to:

Office of Environmental Adjudication
ISTA Building Suite 618
150 W. Market Street
Indianapolis, IN 46204

The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) The date the document is delivered to the Office of Environmental Adjudication;
(2) The date of the postmark on the envelope containing the document, if the document is mailed to the OEA by U.S. mail, or;
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location and date of this notice. Additionally, IC 13-15-6-2 requires that a petition include:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for consideration at the hearing, and;
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

Pursuant to IC 4-21.5-3-5 (d), the Office of Environmental Adjudication will provide you with notice of any prehearing conferences, preliminary hearing, hearings, stays, orders disposing of the review of this decision if a written request is submitted to the Office of Environmental Adjudication at the above address. If you have procedural or scheduling questions regarding your petition, you may contact the Office of Environmental Adjudication at 317-232-8591.

If you have any other questions regarding the enclosed document, please contact Ms. Sara Cloe, Administrative Permit Manager, Office of Air Management Permits Section at 317-233-8586. Callers from within Indiana may call the IDEM Help line at 1-800-451-6027 ext: 68586.

Attachment

EXECUTIVE SUMMARY

Indiana Department of Environmental Management
Office of Air Management

Addendum to the Technical Support Document of the Response to June 22, 2000, Decision from the Environmental Appeals Board to Prevention of Significant Deterioration (PSD) Permit Issued to Steel Dynamics, Inc.

Source Name:	Steel Dynamics, Inc.
Source Location:	2601 County Road 700 East, Columbia City, Indiana 46724
County:	Whitley
Permit No.:	183-12692-00030 to PSD Construction Permit No. 183-10097-00030
Permit Reviewers:	Permit Review Section 2

On June 22, 2000, the Environmental Appeals Board (Board) issued an Order Granting Review in Part and Denying Review in Part with regard to the Prevention of Significant Deterioration (PSD) permit number 183-12692-00030 for Steel Dynamics, Inc. (SDI). Three components of the Prevention of Significant Deterioration (PSD) permit were remanded to IDEM for further consideration: (1) IDEM's treatment of the condensible fraction of lead and the Union's alternative calculation of the potential to emit lead, (2) the cost-effectiveness analysis for selective catalytic reduction (SCR) for nitrogen oxide (NOx) emissions from the reheat furnace, including comparisons of costs to other facilities and technologies, and (3) the form of the best available control technology (BACT) emission limitations for NOx and carbon monoxide (CO) emissions from the electric arc furnace (EAF).

On September 29, 2000 the IDEM published notice of its draft reconsideration of the remand issues. A public hearing was held on October 30 and the public comment period ended on November 6, 2000. The IDEM received numerous comments on the draft reconsideration of the three remand issues. Comments were also submitted regarding the completeness and availability of documents related to the reconsideration. The IDEM has provided detailed responses to the comments relevant to these issues in the attached Addendum to the Technical Support Document. The IDEM final decision regarding the EAB's remand includes the following determinations:

Lead emissions The supporting information that the IDEM has included in the record is based on the best available information and includes the condensible fraction of lead. The data supports a finding that SDI's potential to emit lead is less than the PSD applicability level. Nevertheless, additional conditions are added to the permit to ensure that total building enclosure and proper operation of enhanced air pollution control systems limit SDI's potential to emit lead to less than the PSD applicability level. The record also demonstrates that the permit conditions conform with case law and U.S. EPA guidance applicable to limiting potential to emit in new source permitting.

NOx controls on the reheat furnace The IDEM has thoroughly reviewed information regarding the cost-effectiveness of SCR. SCR has a cost-effectiveness of $17,338 per ton which is considered to be economically infeasible. This is based on an actual price quote by the same company that originally provided the system in place at Beta Steel including line items on the major components of the proposed system. The commenters submitted a line-by-line cost critique that claimed to support a cost effectiveness of $5,400 per ton. The IDEM reviewed this line-by-line cost analysis and found it deficient in several key line items. The record supports adjustments that the IDEM made to these items that result in a cost effectiveness no less than $14,044 per ton which is also considered economically infeasible. The record also supports the conclusion that other technologies are either technically or economically infeasible.

The form of BACT limits on the EAF The EAB ordered the IDEM either to better support pound per hour limits on NOx and CO or to impose production limits in addition to the hourly limits for these pollutants. The final decision adds production limits to the permit. The pound per ton limits on NOx and CO are identical to the emission factors included in the original BACT determination.

The adequacy of the information provided for review A complete administrative record has been maintained in IDEM's public files. The revised permit conditions, the IDEM's Technical Support Document, and portions of the record that were directly relevant to the draft reconsideration were also made available for public review in Whitley County. Additionally IDEM extended the comment period to allow extra time for public participation. There is no state or federal requirement to provide the complete administrative record unless requested under applicable open records law. The IDEM complied with both the letter and the spirit of all requirements concerning making documentation available to the public. Both the IDEM and the U.S. EPA promptly provided additional records upon request.

Conclusion IDEM has fulfilled the obligations of all three (3) remand issues. With regards to lead emissions, IDEM has provided the most accurate and best supported estimate of lead emissions, which shows that lead emissions will be less than 0.6 tons per year. IDEM has also added numerous permit conditions as well as revised existing permit conditions to make the limits enforceable as a practical matter. These conditions go above and beyond the requirements of any other PSD permit issued to a similar source. With regards to NOx control for the reheat furnace, IDEM has thoroughly reviewed information regarding the cost effectiveness of SCR, as well as commenter's proposed costs. IDEM's cost estimates provide the best supported and most realistic figures for the cost of SCR. IDEM's complete analysis shows that SCR is not economically feasible. With regards to the NOx and CO limits on the EAF, IDEM has fulfilled the obligations of the remand by adding production limits to the permit.

Indiana Department of Environmental Management
Office of Air Management

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On June 22, 2000, the Environmental Appeals Board (Board) issued an Order Granting Review in Part and Denying Review in Part with regard to the Prevention of Significant Deterioration (PSD) permit number 183-12692-00030 for Steel Dynamics, Inc. (SDI).[1] Three components of the Prevention of Significant Deterioration (PSD) permit were remanded to IDEM for further consideration: (1) IDEM's treatment of the condensible fraction of lead and the Union's alternative calculation of the potential to emit lead, (2) the cost-effectiveness analysis for selective catalytic reduction (SCR) for nitrogen oxide (NOx) emissions from the reheat furnace, including comparisons of costs to other facilities and technologies, and (3) the form of the best available control technology (BACT) emission limitations for NOx and carbon monoxide (CO) emissions from the electric arc furnace (EAF).

On September 29, 2000, the Office of Air Management (OAM) had a notice published in The Post and Mail, Whitley County, Indiana, stating that the PSD permit issued to Steel Dynamics, Inc. had been appealed to and remanded by the Environmental Appeals Board. The notice stated that IDEM had further considered the three components of the remand and had documented its preliminary determination in a Technical Support Document and proposed to issue a PSD construction permit modification. The notice also included information on how the public could review the proposed permit modification and other documentation.[2] Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments, which IDEM later extended until November 6, 2000. A public hearing was held on October 30, 2000.[3]

Comments on the proposed permit modification were received from:

1. Solomon Lowenstein and Ron Van Mersbergen for the Citizens Organized Watch, Inc. (COW)
2. Rosemary Spalding, Dr. J. Phyllis Fox, and Charles Berger for the United Associations of Plumbers and Steamfitters Local Union 166 (Union)
3. Dorinda Heiden - President of the Whitley County Economic Development Corporation
4. Gary Woods - member of the Millwright Local 1029
5. Robert Taylor
6. Thad and LuAnn Coverstone
7. Niels Hansen

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[1] See the Environmental Appeals Board's Order Granting Review in Part and Denying Review in Part, decided June 22, 2000.

[2] All supporting information is available in IDEM's public files and can be inspected and copied by interested parties.

[3] A full transcript of the public hearing is also part of the record of this permit decision and can be obtained by phoning the OAM at (317) 233-0178. It is also available on IDEM's website at: http://www.state.in.us/idem/oam/permits.pdf.

8. William Carnes
9. Eve Bratton
10. Charlie Kille
11. Daniel and Sandra Trimmer
12. Fred Webb
13. Mark Roach
14. Robert Joyce
15. Ronald Noyer
16. Cheryl Noyer
17. Thomas Alan Childers
18. Mark McCleskey
19. Jamie Wesseler
20. Joann Brennan
21. Thomas Davis
22. Nondus Carr
23. William Klein
24. Joseph O'Hara
25. Joy Richey
26. Roger Dammeier
27. U.S. EPA

The comments received during the comment period can be categorized into the following five (5) categories:[4]

(1) lead emissions;
(2) control of NOx emissions from reheat furnace;
(3) NOx and CO BACT format for the electric arc furnace (EAF);
(4) availability/completeness of the document provided locally during the public comment period; and
(5) miscellaneous other items that are not part of the remand.

1. Lead Emissions

The comments regarding the lead emissions can be further categorized into the following four (4) categories:

(A) fugitive lead emissions from meltshop and other sources;
(B) stack emission estimates;
(C) enforceability of lead emission limits in the permit; and
(D) health effects of lead emissions.

Following are IDEM, OAM's responses to each category of comments regarding lead emissions.

(A) Fugitive Emission Estimates

COW, as well as the Union, through their consultant Dr. Fox, provided comments regarding IDEM's

[4] In addition to the following discussion in this TSD addendum, the permit documents and supporting information from the July 7, 1999 permit decision are hereby incorporated by reference.

estimate of the fugitive lead emissions from the meltshop. Dr. Fox (on page 18 of her comments)[5] suggests that IDEM should include conditions in the permit requiring better controls to ensure good capture and control efficiency. She states (on page 8 of her comments) "[IDEM's] fugitive calculations immediately above assume that the ladle metallurgical station canopy captures 99% of the emissions and the continuous caster canopy captures 98% of the emissions. These are very high capture efficiencies for canopy hoods and are only achieved with segmented canopy hoods, scavenger ducts, cross-draft partitions, and closed roofs." The RTI report[6] (page 4-18, and Table 6-10 on page 6-17), which Dr. Fox relies upon for her arguments, also states that with the addition of these controls, 99 percent capture efficiency is achievable. IDEM has now included permit conditions requiring SDI to comply with a total enclosure of the meltshop. SDI will not be permitted to have any roof monitors in the meltshop. Additionally, IDEM has included conditions specifying a segmented canopy hood, scavenger duct, and cross-draft partitions. (Attachment A shows specific changes to the permit).

Dr. Fox (and various other commenters) correctly pointed out a typographical error where IDEM left out one coefficient in the equation shown on page 2 of the September 27, 2000 technical support document (TSD) to calculate the fugitive lead emissions, namely the capture efficiency of the canopy hood. The equation should have been written as follows (the new text is shown in bold):

Fugitive Lead Emission Calculations:
1.4 lbs PM/ton steel x 0.005 lb Pb/lb PM x 200 ton steel/hr **x (1-0.995)** = 0.0068 lbs fugitive Pb/hour
0.0068 lbs Pb/hr x 8760 hr/yr x 1 ton/2000 lbs = 0.03 tons fugitive Pb/year

Dr. Fox and COW object to using the capture efficiency of the canopy hood as part of the equation because they claim that the emission factor listed in AP-42 for PM emissions (1.4 lbs/ton) is already a controlled factor. They also claim that this emission factor only accounts for filterable PM emissions from charging, tapping, and slagging. IDEM does not agree that the emission factor presented in AP-42 accounts for only filterable lead emissions; nor does IDEM agree that the emission factor is meant to estimate controlled emissions. AP-42[7] describes this factor as "uncontrolled emissions escaping the monitor." This would indicate that this factor represents emissions from the roof monitor for a source without a canopy hood. Since SDI's proposed facility includes a canopy hood, IDEM believes that it would be appropriate to reduce this factor by the capture efficiency of the canopy hood. Logically, this would also make sense because the air flow out of the roof monitor is relatively low; therefore, uncontrolled filterable particulate emissions of 280 pounds per hour escaping the canopy hood and exiting from the roof monitor (as Dr. Fox suggests) would result in an extremely high particulate grain loading out of the roof monitor.

Dr. Fox's and COW's Suggested Fugitive Particulate Emission Rate:
1.4 lbs PM/ton steel x 200 ton steel/hr = 280 lbs fugitive PM/hour

Such a high particulate grain loading out of the roof monitor would result in visible emissions. Since new steel mills are required to achieve less than 3% opacity from their roof monitors, which is equivalent to

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5 See Comments: Proposed Permit Modification of Construction and Operation Permit for Steel Dynamics, Inc. in Whitley County Permit Modification No.: 183-12692-00030, received by IDEM on November 6, 2000.

6 U.S. EPA, Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels in Steel Industry-Background Information for Proposed Revisions to Standards, Report EPA-450/3-82-020a, July 1983.

7 See Compilation of Air Pollutant Emission Factors (AP-42), EPA, 5th ed., January 1995, Vol. 1: Stationary Point and Area Sources, Section 12.5: Iron and Steel Production, Table 12.5-1: Particulate Emission Factors for Iron and Steel Mills (Uncontrolled EAF emissions from Melting and Refining, and Charging, Tapping and Slagging).

no continuous visible emissions during a six-minute period, a high particulate emission rate from the roof monitor as suggested by Dr. Fox is not reasonable to assume. Additionally, the only fugitive emissions that would be emitted from the EAF would occur during charging, tapping, and slagging because the furnace lid is open only during charging and the furnace is tilted only during the tapping and slagging phases of operation. The vast majority of the emissions from the EAF occur during the melting and refining phases of operation when the furnace lid is closed and the fourth hole is fully engaged; therefore, with a well-designed capture system all emissions during melting and refining would be captured and vented to the baghouse.

IDEM believes that its original calculation of fugitive lead emissions is the most reasonable and best supported methodology for estimating fugitive lead emissions. IDEM does agree that, because there is very little data available on fugitive emissions from these types of facilities, there are different equations and assumptions which could be used to estimate fugitive emissions. Even Dr. Fox has provided more than one estimate of fugitive lead emissions in her various submittals to IDEM and provides more than one in her latest submittal of comments. On page 9 of Dr. Fox's comments,[8] she presents one alternative approach to calculating fugitive emissions. This approach uses an equation presented by EPA in their RTI report.[9] Dr. Fox states "The method used by IDEM to estimate lead emissions from the EAF is very complex and suffers from the need to make a number of assumptions that are not supported with data. The EPA has presented an alternate approach for estimating fugitive emissions from EAFs that is far simpler and provided the regulatory basis for delisting the EAF source category." Using that equation presented by Dr. Fox and conservatively assuming 99 percent overall capture efficiency for the additional control measures included in the final permit, gives the following results:

Equation: Fugitive Emissions = (1-capture efficiency) x EF x ST x PC / 2000

Where EF is the fugitive emission factor, which EPA assumes is 2.0 lb/ton;[10]
ST is the annual steel production in tons per year (200 tons per hour x 8760 hours per year); and
PC is the lead content in the EAF dust (0.5%).

Fugitive Emissions = (1-0.99) x 2.0 x 200 x 8760 x 0.005 / 2000 = 0.088 tons Pb per year

Dr. Fox also states that the fugitive emissions from slag handling were not included in the facility-wide totals. The methodology used to estimate the lead emissions from slag handling is discussed in detail in the addendum to the technical support document which was included with the final permit issued on July 7, 1999.[11] IDEM still maintains that fugitive lead emissions from slag handling would not exceed 0.002 tons per year, which IDEM believes is a very conservative estimate. IDEM did not previously include these emissions in the facility-wide total because they are not significant enough to affect the outcome. However, in order to demonstrate that IDEM has considered every possible source of lead emissions, the insignificant contributions from slag handling are now included in the facility-wide totals, as shown below.

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8 See Comments: Proposed Permit Modification of Construction and Operation Permit for Steel Dynamics, Inc. in Whitley County Permit Modification No.: 183-12692-00030, received by IDEM on November 6, 2000.

9 See page 22 of Justification for Delisting EAF Source Categories.

10 IDEM notes here that AP-42, Table 12.5-1 uses 1.4 lb/ton instead of 2.0 lb/ton; therefore, IDEM believes that using 2.0 is a very conservative estimate of fugitive PM emissions.

11 See Response to Comment #16 on page 32 of 86 of the TSD addendum included with the final permit issued on July 7, 1999.

When all of the fugitive lead emissions are added together with the lead emissions from the stack (discussed below in item B), the result is still total lead emissions well below the PSD applicability threshold level of 0.6 tons per year, as shown below.

Fugitive Emissions from meltshop:	0.088	tons per year
Fugitive Emissions from slag handling:	0.002	tons per year
Stack Emissions:	0.342	tons per year
Total lead Emissions:	0.432	tons per year

In summary, IDEM has incorporated Dr. Fox's suggestion to require better controls to ensure near total capture efficiency. IDEM has also used Dr. Fox's suggested equation presented by EPA in the RTI report, in order to estimate fugitive lead emissions from the meltshop. The result is still lead emissions less than the PSD applicability threshold level of 0.6 tons per year.

(B) Stack Emission Estimates

COW, as well as the Union, through their consultant Dr. Fox, provided comments regarding OAM's estimate of the lead emissions from the meltshop baghouse stack. The OAM based its emission estimate on the results of stack tests performed recently on other meltshop operations. The results of various tests were averaged to obtain an emission factor (pounds of lead emitted per ton of steel produced), which was then used to calculate the lead emissions from SDI's meltshop baghouse, based on their maximum design production rate of 200 tons of steel per hour. Dr. Fox's objections to OAM's calculations focus on (1) the sources with the highest lead emission rates were omitted; (2) at least one of the facilities only reported filterable lead; (3) some do not include contributions from the ladle metallurgical station and continuous caster; and (4) the results of the IPSCO test are incorrect. She concludes that as a result, lead emissions as calculated by IDEM, are underestimated. Dr. Fox later provides her own estimate of emissions based on the results of 16 source tests compiled by the EPA from industry data.

For reference, IDEM's source test table is shown below:

Facility	Pb Emissions from Test (lbs/hour)	Steel Production Rate during Test (tons/hour)	Pb Emission Factor (lbs Pb/ton steel)	Calculated Pb Emissions for SDI	
				lb/hr	tpy
Arkansas Steel, AR	0.078	Not Reported	-----		
Gallatin Steel; KY	0.014	154	0.00009	0.018	0.079
IPSCO Steel; IA	0.044	120	0.00037	0.074	0.324
Nucor; Huger, SC	0.04 0.047	184 202	0.00022 0.00024	0.044 0.048	0.193 0.210
Nucor-Yamato; AR	0.0144 0.00728	Not Reported	-----		
Qualitech Steel; IN	0.032	72.8	0.00044	0.088	0.385
Average Emission Factor, lb/ton steel:			0.00027	0.054	0.238

Calculations:

Emission Factor from Test Data, lb Pb/ton steel = $\frac{\text{Pb Emissions from Test (lbs Pb/hr)}}{\text{Steel Production Rate during Test (tons steel/hr)}}$

Controlled Pb Emissions from SDI Meltshop, lb/hr = Emission Factor from test data (lbs Pb/ton steel) x Max SDI Steel Rate (200 tons steel/hour)

Dr. Fox states that the lead results for Arkansas Steel are only for filterable lead. From this, she concludes that other source tests used by IDEM may also only include filterable lead and therefore, are not representative of total lead emissions from the stack. IDEM has contacted the regulatory agencies and/or testing agencies associated with all of the stack tests shown in the table. IDEM has obtained written confirmation that all of the stack test results listed in the table which were used by IDEM to obtain an emission factor, were determined using stack test method 12 to measure lead emissions from the stack.[12] Method 12 measures both filterable and condensible lead emissions.[13] The lead emissions for Arkansas Steel were not determined by stack testing for lead emissions. IDEM has confirmed that the lead emissions for Arkansas Steel were determined by analyzing the EAF baghouse dust for lead content, then multiplying that result by the particulate emission rate.[14] Although Dr. Fox states that the lead emissions for Arkansas Steel do not include condensible lead, she still goes on to object to IDEM's exclusion of these results from the data set. The method for estimating lead from the Arkansas Steel meltshop baghouse stack was vastly different from the method used for the other facilities listed in the table. Specifically, unlike the data for the other facilities, the Arkansas Steel data was not based on a direct measurement of the lead emissions from the stack. These differences provide sufficient reason to exclude the Arkansas Steel data from consideration.

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12 See letters and e-mails from regulatory agencies and stack test companies.

13 See EPA Code of Federal Regulations, 40 CFR 60, Appendix A - Test Methods, Method 12 - Determination of inorganic lead emissions from stationary sources.

14 See letter from RAMCON concerning stack test method for Arkansas Steel, AR.

Dr. Fox also states that some of the stack test results do not include contributions from the ladle metallurgical station (LMS) and the continuous caster (CC). However, Dr. Fox fails to specify that the only source test that did not include contributions from the LMS and CC is the one for Nucor-Yamato, which IDEM had not included because the production rate during the stack test is unknown; therefore it is impossible to determine an emission factor from the Nucor-Yamato stack test data. IDEM specifically points out for the record that the results from Nucor-Yamato were not included in the data set used to obtain an emission factor. Dr. Fox has merely provided another reason to support IDEM's exclusion of those results from the data set.

Dr. Fox points out that there was an error in the data IDEM reported for IPSCO Steel. She states that the emission rate during the test was 0.06 pounds per hour at a production rate of 126 tons of steel per hour, which results in an emission rate of 0.00048 pounds per ton of steel. IDEM contacted the Iowa Department of Natural Resources and was informed that the original data they gave to IDEM and Dr. Fox regarding IPSCO's stack test result, were incorrect.[15] IDEM obtained the "heat sheets" completed by IPSCO during the stack test and determined that the actual production during the test was 62.5 tons per hour.[16] Using the corrected data for IPSCO Steel, the average of the data from the stack tests shown in the table, still excluding Arkansas Steel and Nucor-Yamato, is 0.00039 pounds of lead per ton of steel produced. Applying this emission factor to SDI's process gives an emission rate of 0.342 tons per year, instead of 0.238 tons per year as previously determined by IDEM. The revised table is shown below:

Facility	Pb Emissions from Test (lbs/hour)	Steel Production Rate during Test (tons/hour)	Pb Emission Factor (lbs Pb/ton steel)	Calculated Pb Emissions for SDI	
				lb/hr	tpy
Arkansas Steel, AR	0.078	Not Reported	-----		
Gallatin Steel; KY	0.014	154	0.00009	0.018	0.079
IPSCO Steel; IA	~~0.044~~ **0.06**	~~120~~ **62.5**	~~0.00037~~ **0.00096**	~~0.074~~ **0.192**	~~0.324~~ **0.841**
Nucor; Huger, SC	0.04 0.047	184 202	0.00022 0.00024	0.044 0.048	0.193 0.210
Nucor-Yamato; AR	0.0144 0.00728	Not Reported	-----		
Qualitech Steel; IN	0.032	72.8	0.00044	0.088	0.385
Average Emission Factor, lb/ton steel:			~~0.00027~~ **0.00039**	~~0.054~~ **0.078**	~~0.238~~ **0.342**

Calculations:

Emission Factor from Test Data, lb Pb/ton steel = $\frac{\text{Pb Emissions from Test (lbs Pb/hr)}}{\text{Steel Production Rate during Test (tons steel/hr)}}$

Controlled Pb Emissions from SDI Meltshop, lb/hr = Emission Factor from test data (lbs Pb/ton steel) x Max SDI Steel Rate (200 tons steel/hour)

15 Personal Communication with Mark Stone, Iowa DNR, on December 18, 2000.

16 See facsimile from Iowa DNR to IDEM including heat sheets for IPSCO Steel stack test. IDEM points out that the corrected data for IPSCO results in a higher emission factor than the one suggested by Dr. Fox.

When these lead emissions from the stack are added together with IDEM's conservative estimate of fugitive lead emissions (discussed in item A above), the result is still lead emissions less than the PSD applicability threshold level of 0.6 tons per year.

Fugitive Emissions from meltshop:	0.088	tons per year
Fugitive Emissions from slag handling:	0.002	tons per year
Stack Emissions:	0.342	tons per year
Total lead Emissions:	0.432	tons per year

The revised stack lead limit in the permit was calculated as follows:

Total lead Emissions Limit:	0.590	tons per year
Fugitive Emissions from meltshop:	-0.088	tons per year
Fugitive Emissions from slag handling:	-0.002	tons per year
Allowable Stack Emissions:	0.500	tons per year

0.500 tons allowable stack Pb/year / 8760 hr/yr x 2000 lbs/ton = 0.114 lbs Pb/hour

Dr. Fox provided her own estimate of stack emissions based on the results of 16 source tests compiled by the EPA from industry data. This data was compiled in the 1993 RTI report, which was prepared to estimate HAPs emissions from meltshops in the steel industry. Dr. Fox's calculations resulted in a lead emission estimate of 4.03 tons per year, based on a "controlled" emission factor of 0.0046 pounds of lead per ton of steel produced:

$$\frac{0.0046 \text{ lbs Pb/ton steel} \times 200 \text{ tons steel/hr} \times 8760 \text{ hr/year}}{2000 \text{ lbs/ton}} = 4.03 \text{ tons Pb/year}$$

The controlled emission factor relied on by Dr. Fox is based on the 1993 RTI Report for HAP emissions associated with EAF operations. Dr. Fox used the following 16 sources (out of 42 sources with reported lead emissions) from the RTI report.

No.	Facility	Pb Emissions, Stack+Fugitive (tons Pb/yr)	Annual Pb Production (tons steel/yr)	Emission Factor (lb Pb/ton steel)	Capture Device *
Non-Stainless Steel Facilities:					
1	Arkansas Steel; Newport, AR	0.31	97,100	0.0064	sd
2	Birmingham Steel; Birmingham, AL	1.21	336,000	0.0072	4h, tbe
3	Cascade Steel; McMinnville, OR	0.0164	368,300	0.000089	4h, c
4	Charter Steel; Saukville, WI	0.0004	160,000	0.000005	4h, c, tbe
5	Florida Steel; Baldwin, FL	1.51	431,790	0.0070	4h, c
					tbe
					tbe

No.	Facility	Pb Emissions, Stack+Fugitive (tons Pb/yr)	Annual Pb Production (tons steel/yr)	Emission Factor (lb Pb/ton steel)	Capture Device *
6	Florida Steel; Charlotte, NC	0.969	259,000	0.0075	4h, c, tbe
					4h, c, tbe
					4h, c, tbe
					tbe
7	Florida Steel; Jackson, TN	1.67	420,000	0.0080	4h, c, tbe
8	Florida Steel; Tampa, FL	0.755	200,000	0.0076	4h, c, tbe
					4h, c, tbe
					4h, c, tbe
					4h, c, tbe
9	New Jersey Steel; Sayreville, NJ	0.48	932,000	0.0010	4h, c
10	North Star Steel; Wilton, LA	0.65	330,000	0.0039	4h, c
11	Nucor Steel; Darlington, SC	0.829	400,000	0.0041	sd, ladle
					4h, c
					sd
12	Nucor Steel; Jewett, TX	3.07	500,000	0.0123	sd, c
13	Nucor Steel; Plymouth, UT	1.81	503,888	0.0072	4h
14	Structural Metals; Seguin, TX	0.0348	593,000	0.00012	4h, c
					4h c
Stainless Steel Facilities:					
15	J&L Specialty; Midland, PA	0.226	400,000	0.0011	4h, c
16	Republic Steel; Canton, OH	0.02	1,100,000	0.00004	tbe
Average Pb Emission Factor, lb/ton:				0.0046	

* Acronym Definitions: 4h - 4th Hole Evacuation System; c - Canopy;
sd - Side Draft Evacuation System; tbe - Total Building Enclosure

Dr. Fox states that she selected the above-mentioned RTI sources because the data was reported to have been based on testing. These 16 sources included 14 non-stainless steel facilities and 2 stainless

steel facilities. From this data set, she added the reported stack and fugitive annual lead emissions, and divided by the reported annual steel production numbers. She then averaged the calculated values for the 16 sources. It should be noted that the RTI report itself does not attempt to perform such calculations and that nowhere in the RTI report is an emission factor of 0.0046 pounds of lead per ton of steel produced reported.

As part of the remand, the EAB directed IDEM to consider and respond to the Union's alternative calculation of PTE lead. In IDEM's initial response outlined in the TSD for the proposed permit, IDEM pointed out that four of the sixteen emission factors, when applied to the steel production rate at SDI's proposed facility, resulted in emissions less than 0.6 tons per year. Dr. Fox has now submitted comments stating that "it is not reasonable to select only a small number of sources when a much larger data base is available, due to the variability of lead in EAF emissions." She states that "IDEM has mined the data by selecting only the four lowest measurements to validate its original clearly erroneous assumption that lead emissions are less than 0.6 tons per year." She concludes that the only defensible approach to calculating EAF lead emissions is to use either the upper end of the range from demonstrably similar facilities, or an average. IDEM does not agree with this position. In fact, IDEM's proposed methodology of using only the data from the best controlled sources is the same methodology that EPA would have used to evaluate the RTI data if they had decided to develop an MACT standard for the source category. Hypothetically speaking, *if* the data presented in the RTI report were to be used to develop emission standards for HAPs, then those standards would have been determined using the methodology required by Section 112(d) of the Act.[17] Section 112(d)(3) states (bold typefaces used for emphasis):

> **The maximum degree of reduction in emissions that is deemed achievable for new sources in a category or subcategory shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source**, as determined by the Administrator. Emission standards promulgated under this subsection for existing sources in a category or subcategory may be less stringent than standards for new sources in the same category or subcategory, but shall not be less stringent, and may be more stringent than -
>
> (A) the average emission limitation achieved by the best performing 12 percent of the existing sources...for categories and subcategories with 30 or more sources, or
>
> (B) the average emission limitation achieved by the best performing 5 sources (for which the Administrator has or could reasonably obtain emissions information) in the category or subcategory for categories or subcategories with fewer than 30 sources.

First, it should be noted that *if* a source category for HAPs emissions were to be developed for EAF operations, the emission standard for <u>new</u> sources would be no less stringent than the emission control that is achieved in practice by the best controlled similar source. Within the data set used by Dr. Fox, five of the sixteen tested sources are emitting at levels at or below the emission level proposed by SDI, which is below the significant PSD threshold of 0.6 tons of lead per year.

Based on those facilities used by Dr. Fox, it appears that Charter Steel in Wisconsin operates a similar facility to the proposed SDI - Whitley County plant in terms of PM control because the capture and control technologies are the same and both produce similar products. It also appears that of all of the

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[17] See EPA Clean Air Act Amendments of 1990, Section 112: Hazardous Air Pollutants.

sources with control technologies and products similar to SDI's, Charter Steel is the best controlled source. Applying the emission factor developed from the Charter Steel information to the proposed SDI facility, the calculated lead emissions based on SDI's proposed maximum production capacity results in emissions that are also much less than the PSD significant threshold level for lead (0.6 tons/year):

Pb Emission Rate = 0.000005 lb Pb/ton steel x 200 tons steel/hour x 8760 hours/year x 1 ton/2000 lbs
= 0.004 tons Pb/year

This result is significantly lower than IDEM's estimate of the lead emissions from SDI's stack, which is 0.342 tons per year. Since SDI's proposed permit requires them to utilize the same control technologies as Charter Steel, the above example demonstrates that the estimate made by IDEM is reasonable, and even conservative, for a well-controlled similar source. It should also be noted that of the facilities used by Dr. Fox, several of them that report using less effective control technologies than SDI's proposed facility, still report less than 0.6 tons per year of total lead emissions. This is also evidence that IDEM's estimate is reasonable and that the proposed limit is in fact achievable.

Second, if EPA were to develop an emission standard for existing sources using only the 16 sources proposed by Dr. Fox, they would only take the average emission limitation achieved by the best 5 sources as stated in Section 112(d)(3)(B). The best 5 sources are shown in the following table.

No.	Facility	Emission Limitation (lb Pb/ton steel)
1	Charter Steel; Saukville, WI	0.000005
2	Cascade Steel; McMinnville, OR	0.000089
3	Republic Steel; Canton, OH	0.00004
4	Structural Metals; Seguin, TX	0.00012
5	New Jersey Steel; Sayreville, NJ	0.0010
Average Emission Limitation for Best 5 Sources:		0.000251

Applying the above average emission limitation to the proposed SDI facility, the calculated lead emissions based on the proposed maximum production capacity results in emissions that are less than the significant PSD threshold level for lead (0.6 tons per year):

Pb Emission Rate = 0.000251 lb Pb/ton steel x 200 tons steel/hour x 8760 hours/year x 1 ton/2000 lbs
= 0.22 tons Pb/year

This result is also significantly lower than IDEM's estimate of the lead emissions from SDI's stack, which is 0.342 tons per year. As shown in the previous examples, there are other methodologies that can be used to evaluate the lead emissions from the RTI data which demonstrate that emissions are below the PSD significant threshold level for lead. Even so, there are multiple problems with using data like those presented in the RTI report as a reliable source of information on which to base an emission factor, because there are too many unknown variables, such as:

(1) No specific stack test methods are stated in the RTI Report.
(2) No analytical methods used to measure the lead are stated in the RTI Report.
(3) No actual production rates during the stack tests are provided in the RTI Report.

(4) No information on the permit issuance, permit emission limits for lead or other permit conditions for the baghouse or other control devices are reported in the RTI Report.
(5) No compliance demonstration with applicable limits are shown in the RTI Report.

Absent a critical review of these factors, it is not reasonable to use data from these other sources as representative of the expected control levels that will be achieved by the proposed SDI facility. Even if this data were available for review, IDEM has found that there are other reasons why the use of this data by Dr. Fox's methodology would provide a less realistic estimate of the lead emissions from SDI's proposed facility than IDEM's methodology.

First, Dr. Fox uses data from sources that are not similar in design to SDI's proposed facility. IDEM is now requiring SDI to comply with permit conditions specifying total enclosure of the meltshop and requiring them to install a segmented canopy hood, scavenger ducting, and cross-draft partitions. These conditions will result in making SDI subject to the most stringent control requirements in its source category. In contrast, some of the sources used by Dr. Fox do not report having a canopy hood. Additionally, many of the sources do not report having a total enclosure of the meltshop. This alone makes SDI's proposed facility a much better controlled facility than many of the sources used by Dr. Fox to estimate emissions. Furthermore, none of the sources used by Dr. Fox specify what type of canopy is used, whether cross-draft partitions are used, or whether scavenger duct has been installed. For all of these reasons, it is reasonable to conclude that SDI's emissions will be significantly lower than the emissions from many of these sources. Dr. Fox makes no attempt to either disregard those sources with lower levels of control or to adjust the emission estimates based on the differences in the levels of control. Consequently, her methodology drastically overestimates emissions.

Second, the source test results are reported in tons per year and there is no indication whether these results are based on actual production or production at rated capacities. The actual production levels during the stack tests are not reported. The reported emissions may very well be based on the emission rate during production at rated capacities, whereas the production levels used by Dr. Fox represent an actual annual production level. As such, it would not be appropriate to divide the source test results by the annual production figures. The methodology used would produce unrealistically high emission factors. Dr. Fox states that it is very unlikely that the sources would overestimate their emissions by calculating them at rated production rather than actual production. However, since the purpose of gathering the data in the first place, was to estimate the potential to emit (PTE) of sources, IDEM believes that it is likely that the emissions were calculated using the rated capacities. Regardless, IDEM does not have sufficient information to justify the use of the RTI information.

Finally, there is no way to correlate the reported emission rates with the raw materials used in the various processes as compared with the materials SDI will use. Dr. Fox states that this is irrelevant.[18] She states that "...raw material feed does not significantly effect the composition of emissions." IDEM disagrees and notes that Dr. Fox also seems to now disagree with her previous statement because in her subsequent submittal of comments[19] she states "...most of the lead emitted from EAFs originates in the scrap." IDEM believes that the use of low lead content scrap will result in lower lead emissions than the use of high lead content scrap. That is why IDEM has included a scrap management plan as a permit requirement for SDI. Since the data used in the RTI report were based on testing that was conducted several years ago, it is very unlikely that those sources used scrap similar to what SDI would be required to use by the proposed permit. The lead content of the scrap used in these types of facilities today is much lower than the lead content of the scrap used several years ago. This is mainly due to

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[18] See page 5 of Exhibit 8 Fox Comment Letter, July 2, 1999.

[19] See page 13 of Comments: Proposed Permit Modification of Construction and Operation Permit for Steel Dynamics, Inc. in Whitley County Permit Modification No.: 183-12692-00030, received by IDEM on November 6, 2000.

two factors: (1) scrap yards do a better job today of segregating and screening their scrap for materials which would have a high lead content; and (2) scrap today has a lower lead content because there are fewer sources of lead.[20] Dr. Fox makes no attempt to either disregard those sources with different types of raw materials or to adjust the emission estimates based on the different raw materials used.

For the reasons discussed above, the emission levels proposed by Dr. Fox are overstated. The data Dr. Fox relies on come from stack tests which were conducted several years ago using unknown stack test methods. Conversely, the stack test results used by IDEM were all conducted within the past five (5) years using Method 12 which includes measuring both filterable and condensible lead emissions. As a result, IDEM's methodology for estimating lead emissions from the stack at SDI's proposed facility gives a much more realistic result than can be achieved through the use of Dr. Fox's methodology.

In all of Dr. Fox's comments, she has not refuted IDEM's fundamental argument that recent stack test data from other similar facilities indicate that, with the restrictions set forth in the permit, SDI will meet an emission limit of less than 0.6 tons of lead per year. It is clear from all of the information compiled in association with this permit review and appeal that there are many facilities similar to SDI's proposed facility which can and do comply with lead emission limits less than 0.6 tons per year. IDEM believes that calculations based on generic or limited data are useful mainly to identify parameters that affect potential to emit (PTE). These parameters can then be definitively addressed in the permit by conditions that limit PTE in accordance with case law and U.S. EPA policy. Only when the permit does not provide for the practical enforceability of limitations on the PTE would the issue rely on the assumptions used in a calculation. This leads to the third category of comments concerning lead emissions, which deals with the enforceability of the lead emission limits included in the permit.

(C) Enforceability of Permit Conditions

COW, as well as the Union, through their consultant Dr. Fox, provided comments concerning the enforceability of the emission limits included in the permit. The draft permit submitted for public comment limited the combined stack and fugitive lead emissions from the meltshop operations to 0.134 pounds per hour. This is equivalent to lead emissions less than 0.6 tons per year. Dr. Fox and COW claim that the permit limit for lead is not enforceable because it is not accompanied by any production or operational controls to assure that the limit would be met. They further claim that the limit is not enforceable as a practical matter. Dr. Fox and/or COW specifically recommended the following additional permit requirements.

(1) The permit should require total building enclosure and other various controls as specified in the RTI report to ensure good capture efficiency.
(2) The permit should limit the lead content of the baghouse EAF dust and require monitoring the lead content of the dust on a monthly basis.
(3) The quality of the scrap should be specified in the permit.
(4) If total building enclosure is not required, the permit should require monitoring of the emissions from the meltshop roof monitor.
(5) The permit should require annual lead stack testing.
(6) The permit should specify the detection limit for lead.
(7) The permit should include an averaging time for the lead emission limit.
(8) The permit should require a baghouse leak detection system.[21]

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[20] Personal Communication, Nick Olivieri, Manager of Ferrous Trading, OMNI Source, December 27, 2000.

[21] See comments submitted by COW dated November 6, 2000.

IDEM does not agree that the proposed permit did not include limits that were enforceable. The original PSD permit already specified continuous compliance.[22] However, in light of the public concerns surrounding lead emissions and in order to leave no question as to the PTE or the enforceability of the limits, IDEM has revised the permit to include more detailed requirements and more compliance monitoring for lead emissions. These conditions go above and beyond the conditions required by any other PSD permit for similar operations. Specific changes to the permit are shown in the attachment; however, a summary of the new requirements and the reason(s) for each is as follows:

(1) SDI's permit now includes conditions requiring a segmented canopy hood, scavenger duct, cross-draft partitions, and a closed roof in the meltshop.[23] Compliance with the total enclosure requirement will be determined by utilizing one of the test methods outlined in the National Emission Standard for Hazardous Air Pollutants (NESHAP) for secondary lead smelters, 40 CFR 63, Subpart X.[24] [25] This makes the requirement to maintain total enclosure of the meltshop, enforceable as a practical matter. These conditions are included to ensure that SDI's control system achieves the capture efficiency required in the permit.

(2) The permit now limits the lead content of the baghouse EAF dust to 0.5% and requires sampling and analysis of the baghouse EAF dust for lead content on a monthly basis.[26] As Dr. Fox has stated,[27] this ensures little variability of the lead content of the scrap since any additional lead contained in the scrap would result in additional lead in the baghouse EAF dust.

(3) The scrap management plan has been revised to require the source to inspect the scrap and identify and remove more types of items which would be likely to contain lead.[28] This helps to ensure that the scrap used in the EAF will contain as little lead as possible, which will result in fewer lead emissions from the EAF.

(4) There will be no roof shop monitor.

(5) The permit requires stack testing the meltshop baghouse for lead emissions using Method 12 on an annual basis.[29] These stack tests will provide a direct measurement of the filterable and condensible lead from the stack. This makes the stack emission limit for lead enforceable as a practical matter and is part of the overall requirement for SDI to demonstrate continuous compliance with the lead emission limits.

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22 Please refer to draft permit #183-12692-00030, Condition Numbers D.1.12 (BACT Visible Emission Limitation), D.1.17 (Daily Visible Emission Observations and Continuous Opacity Monitoring), D.1.18 (Baghouse Operation), D.1.19 (Baghouse Inspections), D.1.20 (Baghouse Failure Detection), and D.1.21 (Monitoring Operations).

23 See Condition D.1.6 of the final permit modification #183-12692-00030.

24 See Condition D.1.24 of the final permit modification #183-12692-00030.

25 See 40 CFR 63, Subpart X National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting

26 See Conditions D.1.11(b) and D.1.15 of the final permit modification #183-12692-00030.

27 See page 5 of Exhibit 8 Fox Comment Letter, July 2, 1999.

28 See Scrap Management Plan, Attachment B of the final permit modification #183-12692-00030.

29 See Condition D.1.15(d) of the final permit modification #183-12692-00030.

(6) Dr. Fox also stated that IDEM needs to state the detection limit for lead in the permit because she states that by not stating a detection limit in the permit, IDEM makes it possible for the source to specify the detection limit in a future "protocol." She also objects to the statement in the permit which says that stack test results below the detection level indicate compliance. She states[30] "if a method had a detection limit of 1.0 ton per year, this permit condition would find the source in compliance, even though actual emissions may be greater than 0.6 tons per year." IDEM has revised the permit condition to state that the test shall be conducted utilizing Method 12 such that the method detection level is below the emission limit.[31]

(7) Dr. Fox has also stated that IDEM needs to include an averaging time in the permit as part of the lead emission limit. IDEM points out that the limit is written as a pound per hour limit and that SDI is required to demonstrate compliance with the limit by conducting a stack test utilizing Method 12. Therefore, the averaging time is the length of time necessary to conduct a Method 12 stack test.

(8) The permit now requires the installation and continuous operation of a bag leak detection system.[32] This is the same type of requirement that has been included in the NESHAP for secondary lead smelters, 40 CFR 63, Subpart X, in order to ensure continuous compliance with their lead emission limits. Therefore, IDEM concludes that the operation of a bag leak detection system is sufficient as part of the overall requirement for SDI to demonstrate continuous compliance with the lead emission limits in this permit. This also makes the stack emission limit for lead enforceable as a practical matter.

IDEM notes here for the record that with the changes discussed above, IDEM believes it has complied with all of Dr. Fox's and COW's suggestions for how to make the lead limits enforceable.

According to the June 13, 1989-EPA guidance document entitled "Limiting Potential to Emit in New Source Permitting," any permit limitation can legally restrict PTE if it is (1) federally enforceable, and (2) it is enforceable as a practical matter. [33] According to Dr. Fox's comments and according to *United States v. Louisiana-Pacific Corporation*, to appropriately limit PTE, the permit must include a production or operational limitation in addition to the emission limitation. Restrictions on production or operation which will limit potential to emit include limitations on quantities of raw materials consumed, fuel combusted, hours of operation, or conditions which specify the source must install and maintain controls that reduce emissions to a specified emission rate or to a specified efficiency level.

With respect to the lead emissions from the EAF, the limitations required by the SDI permit meet these criteria. First, the SDI permit requires a short-term lead emission limit.[34] Second, the

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30 See page 16 of Comments: Proposed Permit Modification of Construction and Operation Permit for Steel Dynamics, Inc. in Whitley County Permit Modification No.: 183-12692-00030, received by IDEM on November 6, 2000.

31 See Condition D.1.15(d) of the final permit modification #183-12692-00030.

32 See Condition D.1.20 of the final permit modification #183-12692-00030.

33 See "Potential to Emit" definition, 40 CFR 52.21(b)(4) and 326 IAC 2-1.1-1(16) and Limiting Potential to Emit in New Source Permitting, EPA, June 13, 1989.

34 See Condition D.1.11 of the final permit modification #183-12692-00030.

permit includes conditions specifying that the source must install and maintain controls that reduce emissions to a specified rate. The permit does this by specifying a segmented canopy hood, scavenger duct, cross-draft partitions, a closed roof in the meltshop, and proper operation of the meltshop baghouse. Third, the permit includes conditions specifying that the source must maintain those controls that reduce emissions to the specified rate. The permit does this by including comprehensive compliance monitoring conditions, such as operation of the bag leak detection system and a continuous opacity monitor (COM), to ensure proper operation of the controls. In addition, other parameters such as a 3 percent opacity limit for building openings and for the baghouse stack serve as surrogate tools for demonstrating continuous compliance with the lead emission limit. Fourth, the permit includes limitations on raw materials consumed because it requires SDI to comply with a scrap management program, and to monitor the lead content of the baghouse EAF dust. Finally, the permit requires that SDI perform annual stack tests utilizing Method 12 to demonstrate compliance with this lead limitation. These permit conditions meet the requirements of the June 13, 1989-EPA guidance document entitled "Limiting Potential to Emit in New Source Permitting."

All changes to permit conditions are shown in Attachment A.

(D) Health Effects of Lead Emissions

There have been various other comments concerning lead emissions. IDEM notes for the record that the following comments submitted are regarding issues that were not part of the remand. Therefore, either IDEM has already addressed these issues and the Board agreed with IDEM's decision, or they are new issues not within the remand. Therefore, IDEM believes that it is not required to respond to any of these comments. Although concerns surrounding the effects of lead emissions from the meltshop operations were not part of the remand, IDEM respects those concerns identified by the public. Additionally, IDEM believes in its obligation and commitment to all concerns related to the environment; therefore, IDEM provides the following brief responses to comments.

Comment: Commenters asked why IDEM allowed SDI to locate their facility, a lead emitting facility, in Whitley County when Whitley County already has a problem with lead in its children. They expressed concerns about children going to school in areas immediately downwind of the proposed facility. Other commenters stated that the proposed SDI facility is being located right in the center of prime farm land. They are very concerned about any toxic chemicals, especially lead, that might get in the soil. They state that lead is toxic to plants. They point out that in Lake Township, which is just downwind adjacent to the proposed steel mill, there are farms with dairy cows. They are concerned about lead contamination in the milk from the cows.

Response: IDEM does not have any authority over zoning issues; therefore IDEM cannot choose where SDI, or any source, will locate. IDEM is proposing a permit to limit the lead emissions from the proposed SDI facility to levels less than 0.6 tons per year. Data collected show that it is reasonable to expect that SDI will comply with such a limit and IDEM has included many permit conditions to ensure compliance with this limit.

IDEM has conducted a modeling analysis of the lead emissions from the proposed facility, which indicated that lead impacts would be well below the National Ambient Air Quality Standards and the monitoring de minimis limit. These standards are set by the EPA in order to protect public health. At the time the NAAQS were adopted EPA concluded that the standards would also protect crops, vegetation, and animals which are related to public

welfare. IDEM concludes that the emissions from this plant will not threaten the health of citizens living, working, or attending school in the vicinity of the plant.[35]

Comment: One commenter brought up the White River fish kill and asked if something similar could happen with SDI's proposed facility. Specifically the commenter asked if SDI started emitting way too much lead one night, how long could this possibly continue before IDEM found out and required SDI to correct it?

Response: IDEM believes that even massive baghouse failure would not result in a situation analogous to the White River fish kill. The permit contains a number of monitoring and reporting requirements that guard against even minor baghouse leaks and failures. SDI is required to continuously monitor the baghouse with a continuous opacity monitor; therefore, baghouse failure is something that SDI would notice almost immediately and correct it. The permit also requires the installation and operation of broken bag detectors, which will sound an alarm if the baghouse fails. Once baghouse failure has been observed, permit condition D.1.20 requires SDI to shutdown the affected compartment immediately until it has been repaired or the failed bag(s) replaced. This ensures that the failure of the baghouse compartment will not result in uncontrolled emissions escaping through the damaged compartment. Baghouse failure is considered to be a malfunction. Condition C.13 of the permit specifies that all malfunctions lasting more than one (1) hour must be reported to IDEM within four (4) daytime business hours after the beginning of the malfunction. Therefore, IDEM would be notified of any baghouse failure lasting more than one (1) hour.

2. Control of NOx emissions from the Reheat Furnace

Oral testimony specific to control of NOx emissions from the reheat furnace was provided by Mr. Ronald Van Mersbergen, Mr. Charles Kille, Mr. Thomas Davis, and Ms. Nondus Carr. In addition, written comments were received on behalf of the United Association of Plumbers and Steamfitters Local Union 166 (Union)[36] and Citizens Organized Watch, Inc. (COW).[37] The Union submitted comments in a June 30, 1999[38] document which will be addressed here as well. Although the extended comment period ended on November 6, the Union also submitted comments after the close of the public comment period dated November 27, 2000 and December 21, 2000.[39]

IDEM also obtained public comments which were submitted by Dr. Fox in a similar, but unrelated matter

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35 More discussion on this is included in the TSD addendum of the PSD permit CP-183-10097 issued on July 7, 1999, which also addressed these same comments (see, e.g., responses 19 and 20).

36 "Comments: Proposed Permit Modification of Construction and Operation Permit for Steel Dynamics, Inc. in Whitley County Permit Modification No.:183-12692-00030" pages 22 through 68, by Dr. Fox submitted under letterhead of Rosemary G. Spalding, dated November 6, 2000.

37 "Citizens Organized Watch, Inc. Submission of Public Comments", dated November 6, 2000, pages 12-15.

38 Written comments submitted by Dr. J. Phyllis Fox, "Re:SDI, Inc. Columbia City Reheat Furnace," dated June 30, 1999.

39 There is no requirement to respond to the Union's late-filed comments. As a practical matter, these late comments focus on SCR and SNCR technical feasibility, although some unsupported SCR cost per ton information is offered as well. For the sake of discussion, IDEM will mention these comments in this addendum.

in California. Dr. Fox submitted these comments (California Comments[40]) in opposition to the Elk Hills Power Project in Kern County, California. The permitting authority for the Elk Hills Project proposed SCR as BACT, and Dr. Fox felt that SCONOx should be BACT instead. Although Dr. Fox's California Comments discuss many of the same issues raised in her SDI-related comments, her positions in the California Comments are not always consistent with her positions in the Union's SDI comments.

The comments regarding control of NOx emissions from the reheat furnace can be further categorized into the following categories:

(A) technical feasibility;
(B) SCR cost analysis and economic infeasibility;
(C) cost comparison to other NOx control technologies; and
(D) SCR cost comparison to other facilities.

Following are IDEM, OAM's responses to each category of comments regarding NOx BACT on the reheat furnace.

(A) Technical Feasibility

IDEM's determination in the original BACT analysis was that SCR controls for the reheat furnace were economically infeasible. This determination was further supported by the refined SCR cost analysis submitted by SDI as part of the review of the remand issues.[41] Because IDEM did not make a decision on SCR technical feasibility as part of its July 7, 1999 permit decision, the Board presumed that SCR was technically feasible. The Board did not remand the merits of technical feasibility to IDEM for further consideration. In accordance with the Board's decision, IDEM will only respond in detail to comments relating to the SCR cost analysis and economic infeasibility of SCR controls for SDI's reheat furnace, cost comparison to other NOx control technologies, and comparison of SCR costs at other facilities. Some of the comments not related to the remand issues will be addressed separately below.

Technical issues relating to the applicability of SCR controls are not relevant and need not be addressed except to the extent that they impact on the economic analysis. BACT requires that the agency identify the technologies that are available and applicable for the specific source under consideration. In this case, IDEM identified SCR as a possible control option and included it in the BACT analysis. BACT does not require an agency to identify every similar source that uses a particular technology. Comments submitted by the Union on the recent use of SCR at Corus in the Netherlands focus on the technical feasibility of SCR, and provide little information on the costs of SCR. Comments submitted on the use of SCR on pickling lines, boilers or other processes different from a reheat furnace are also not relevant because IDEM had already considered the possibility of SCR use on SDI's reheat furnace.

Mr. Van Mersbergen, speaking on behalf of COW, made several points concerning the technical feasibility of SCR controls. He also made the point that IDEM did not consider other SCR control

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40 Testimony of J. Phyllis Fox, Ph.D. on Behalf of the California Unions for Reliable Energy on Air Quality Impacts of the Elk Hills Power Project, May 8, 2000, Docket No. 99-AFC-1. These comments, which were submitted to the California Energy Commission, are publicly available and were located by a web search: http://www.energy.ca.gov/sitingcases/dockets/ElkHill2.htm. On December 22, 2000 a final decision was made in the Elks Hills siting matter and is available at http://www.energy.ca.gov/sitingcases/elkhills/documents/index.htm.

41 See the Technical Support Document "Response to June 22, 2000 Decision from the Environmental Appeals Board to Prevention of Significant Deterioration (PSD) Permit Issued to Steel Dynamics, Inc."

efficiencies and their associated costs and called the permit deficient because IDEM did not consider an SCR at 50% or 70% control as an option.

Mr. Van Mersbergen's technical feasibility comments are not relevant to the remand and will not be addressed here. IDEM believes that regardless of the control efficiency, there are many SCR costs that are fixed, and that lower control efficiency would only tend to increase the cost per ton, making the SCR system even more economically infeasible. The Union's November 6, 2000 comments agree with IDEM on this matter. Pages 30 and 55 of these comments recognize that: "The higher the efficiency, the more cost effective the system." IDEM does not believe that additional calculations showing 50% or 70% control would be helpful in this case. Likewise, IDEM does not believe that NOx control above 80% is justified for SCR on a reheat furnace. Further discussion of the basis for 80% control efficiency is provided in the economic feasibility portion of this response.

Mr. Kille stated that the feed forward ammonia control, larger plenum and a specific computer control system are almost 40% of the SCR cost (HES actually estimated these items to be 35-38% of the system cost). Because of this, Mr. Kille wanted to know the locations and names of facilities that use these three components.

The vendor, Huntington Environmental Systems (HES), not SDI, proposed the use of these three systems. (Phone call with John Berger, HES, 847-545-8800.) HES provided Beta Steel's SCR, the only SCR operating on a reheat furnace in the country, and proposed these systems due to the operational problems associated with the Beta Steel SCR. Depending on the variability of the process, some facilities may use one or more of these three components. Sometimes these systems may be referred to in different ways. The November 6, 2000 comments provided on behalf of the Union, mentions that burner output is slower than the response time of the control system (similar to a feed forward system) and also mentions retention zones (similar to a plenum) in the Corus design. (p. 26 and Exhibit 10b.) Dr. Fox also states that dedicated program logic controllers and data highway systems (similar to computer controls) are frequently used for SCRs. (California Comments, p. 25.) Finally, Dr. Fox on page 34 of her California Comments agrees that pollution control equipment must be designed for the worst case, which needs to account for variability in the process. These references demonstrate that HES' decision to include these three items is a reasonable way for the vendor to attempt to address variability.

Ms. Carr raised the question that if SDI wanted to build the best facility that they could, why not install an SCR regardless of the cost?

Ms. Carr raises a question that IDEM believes to be a business question for SDI given the very competitive nature of the steel industry. IDEM only has the authority to require those controls for which it has applicable rule requirements. For all of the steel mills that the EAB required IDEM to compare the SCR costs, SCR on a reheat furnace was considered to be infeasible, was not BACT, and was not installed. The only SCR on a reheat furnace in this country (Beta) is located in an ozone nonattainment area, and there was no economic analysis performed for Beta's SCR.

(B) SCR Cost Analysis and Economic Infeasibility

The SDI detailed cost effectiveness analysis of SCR on the reheat furnace relied on a number of actual vendor bids to find an SCR cost per ton of NOx removal as $17,338 per ton. Written comments provided on behalf of the Union suggest that SDI's analysis misrepresents both the technical and economic constraints of the SCR application. The Union criticized both the SCR vendor's bid and SDI's cost effectiveness calculation for the reheat furnace and claimed that $5,400 per ton was more appropriate. The Union further alleges that their revised cost effectiveness analysis of $5,400 is

economically feasible and is within the range borne by other sources. COW also generally calls into question SDI's NOx control cost estimate.[42]

SDI sought actual competitive SCR bids from four (4) well known vendors — Hitachi Zosen U.S.A. Ltd, Mitsubishi Heavy Industries America, Inc., Wheelabrator Air Pollution Control, Inc. and HES. The Union suggested both Hitachi Zosen and Mitsubishi as potential bidders based on those vendors' SCR experience. Three (3) of the vendors, Hitachi Zosen, Mitsubishi and Wheelabrator, stated problems associated with the large temperature and gas volume fluctuations and declined to bid on the SCR system. This information is documented in the September 27, 2000 Remand Technical Support Document. The only vendor to submit a bid was HES. HES is the vendor that originally provided the SCR for Beta Steel. HES based its bid to SDI on HES' experience with the Beta SCR and on experience from other source types. Using the HES bid for SDI's reheat furnace, SDI determined that the cost per ton for NOx removal was $17,338 and reflects the use of an actual detailed bid price. IDEM has not found information from other U.S. steel mills that show a detailed bid price. SDI's cost per ton analysis also provided detailed support for other costs related to the SCR. There is no detailed and reliable cost information for the foreign SCR installations noted by the Union and COW.[43]

On page 33 of Dr. Fox's California Comments, she states that "vendors' costs are likely more accurate than those prepared by any other party because the vendors have direct access to cost information not available to other parties and experience with the technologies. . . . Therefore, I believe that the vendors' estimates of capital and operating costs are more reliable than those presented by other parties." IDEM agrees with that statement. In her SDI comments, though, Dr. Fox criticizes the vendors' costs and offers her own values for capital and operating costs.

The Union performed a line by line analysis of SDI's SCR cost analysis. The Union's comments will be addressed under the headings found on the cost effectiveness analysis chart: Direct Capital Cost (DC); Direct Installation Cost (DI); Indirect Capital Cost (IC); Operation and Maintenance (O&M); and Annual Cost Effectiveness. Page B.44 of the NSR Workshop Manual states that: "The final decision regarding the reasonableness of calculated cost effectiveness values will be made by the review authority considering previous regulatory decisions." IDEM performed its own cost analysis based on previous regulatory decisions. Also, IDEM considered the Union's and COW's comments agreeing where there was a sound basis for the argument, accepting some for arguments sake and rejecting others. The following table compares the SDI, Union and IDEM Adjusted cost analyses for the reheat furnace. Detailed line by line comments follow the table.

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42 COW "Comments for 2nd Draft of SDI PSD (Permit Mod 183-12692, Plt ID-183-00030)" page 14 of 15, paragraph number 12.

43 Further discussion on the cost of SCR at other mills is found in Section 2D below.

CAPITAL COSTS

		SDI	Union	IDEM Adjusted
	Direct Capital Costs (DC)			
	Purchased Equipment Costs (PE)			
1	Selective Catalytic Reduction	2,335,000	1,437,000	1,929,000
2	Rotating Equipment	200,000	42,000	42,500
3	Ammonia Storage Tank	0	0	0
4	CEM Ammonia System	0	0	0
5	CEM NOx System	0	0	0
6	Instrumentation (Ammonia)	225,000	225,000	225,000
7	Truck Unloading Area & NH3 release mitigation	0	0	0
8	Access Way Addition (ammonia deliveries)	0	0	0
9	Auxiliaries: Reheat Furnace Integration w/SCR	190,877	31,731	31,731
10	Sales Tax (5% of equipment in Indiana)	0	0	0
11	Freight	94,772	94,772	94,772
12	Total (PE)	3,045,649	1,830,503	2,323,003
	Direct Installation Costs (DI)			
13	Foundations and Support	205,000	205,000	205,000
14	Handling and Erection	770,000	770,000	770,000
15	Electrical and communications	293,470	293,470	293,470
16	Piping (ammonia, fuel gas, instrument air)	123,000	123,000	123,000
17	Insulation + Painting	-128,563	0	-128,563
18	Auxiliaries: Reheat Furnace Integration w/SCR	151,351	0	0
19	Buildings	0	0	0
20	Site Preparation (road to SCR, site drainage)	34,444	9,444	34,444
21	Total (DI)	1,448,702	1,400,914	1,297,351
22	Total Direct Cost (DC=PE+DI)	4,494,351	3,231,417	3,620,354
	Indirect Capital Costs (IC)			
23	Engineering and Supervision	203,400	203,400	203,400
24	Construction and Field Expenses	30,000	9,600	30,000
25	Contractor Fees	0	0	0
26	Other Components (startup, training, etc.)	180,000	180,000	180,000
27	Startup + Performance	0	0	0
28	Initial CEM Calibration & Performance Testing	0	0	0
29	Prepare Process Safety Management Plan	18,000	0	0
30	Contingencies	91,369	0	69,690
31	Total (IC)	522,769	393,000	483,090
32	Total Capital Investment (TCI=DC+IC)	5,017,120	3,624,417	4,103,444
33	Capital Recovery at 7% interest over 10 years	714,325	342,109	584,330
	OPERATION AND MAINTENANCE (O&M)			
	Direct Annual Costs (DA)			
34	Operator	48,516	6,125	48,516
35	Supervisor	7,277	919	7,277
36	Maintenance Labor	53,367	6,737	53,367
37	Maintenance Material	53,367	6,737	53,367
38	Ammonia (aqueous)	184,821	184,821	184,821
39	Catalyst Replacement & Disposal (every 2 yrs)	121,549	41,526	121,549
40	Annual CEM RATA testing	0	0	0
41	Emergency Response Training	1,350	1,350	1,350
42	Electricity	102,043	10,519	20,585
43	Misc (duct cleaning, fuel adjustment charge)	152,474	0	152,474
44	Total (DA)	724,765	258,734	643,306
	Indirect Annual Costs (IA)			
45	Overhead	97,517	12,311	97,517
46a	Admin., Property Tax, Insurance	200,685	36,244	82,069
46b	Administration		1,761	0
46c	Property Tax		0	0
47	Total (IA)	298,202	50,316	179,586
48	Total O&M (DA+IA)	1,022,967	309,049	822,892
49	TOTAL ANNUAL CAPITAL AND O&M COSTS	1,737,292	651,158	1,407,222
50	Baseline NOx Emissions (tons/yr)	125.3	134.0	125.3
51	Annual NOx Removal, 80% Efficiency (tons)	100.2(80%)	120.6(90%)	100.2(80%)
52	**Annual Cost Effectiveness, $/ton NOx removed**	17,338	5,399	14,044

Response to Comments on Direct Capital Cost (DC) (Lines 1 - 12)
The Union revised SDI's SCR cost from $2,335,000 to $1,437,000 (Line 1) by removing $270,000 for a catalyst, removing $176,000 for a stack and removing $452,000 for savings due to using a water quench system. The Union then revised the rotating equipment cost from $200,000 to $42,000 (Line 2) by removing $158,000 for ID fans. The Union also revised the Auxiliaries: Reheat Furnace Integration w/SCR cost from $190,877 to $31,731 (Line 9). Thus, the Union reduced purchased equipment costs from $3,045,649 to $1,830,503 (Line 12).

The HES bid included $300,000 for catalyst cost. This cost was reduced by $70,000 due to the smaller catalyst needed for 80% removal or 1 lb/hr of NOx, as opposed to 90% removal or 1 lb/hr of NOx. The Union is correct in the claim that the initial catalyst cost is double-counted. The Union is incorrect in subtracting $270,000 for the catalyst cost, though. The correct cost is $230,000 for the smaller catalyst ($300,000 - $70,000). The catalyst costs will be included in the catalyst replacement & disposal cost only (Line 39). Line 1 will be reduced by $230,000 for the catalyst cost.

The inclusion of a bypass stack in the SDI bid was a decision by HES based on its experience. IDEM believes the use of a bypass stack is justifiable solely from a maintenance standpoint. The catalyst will need frequent cleaning and without the bypass stack no one can work in the SCR until the furnace cools, which will take a couple of days. Dr. Fox also acknowledges the valid use of dampers and bypass stacks in her California Comments discussing SCONOx: "Similar dampers are widely used throughout the power industry in air pollution control applications with minimal operational problems as well as in other industries under conditions far more severe than those that would be experienced by the SCONOx dampers. They are also used in bypass applications, when more than one turbine, stack, or other equipment is present, and are used to isolate equipment from exhaust gases to allow man-safe access to perform maintenance while the balance of plant remains in operation. . . . Dampers are also widely used in the steel industry in applications that involve higher temperatures, more corrosive environments, and similar duty cycles." (California Comments, p. 21.) The Union agrees that some bypass-related costs are legitimate. However, for the sake of argument, the entire stack cost will be removed from IDEM's calculation. Line 1 will be reduced an additional $176,000 for the deleted stack.

The June 1999 HES design used the same cooling method (dilution air) as the current, less expensive HES bid. However, the Union made no comment regarding water quench or any other exhaust cooling method. The only example provided by the Union in their comments is for water quench on glass furnaces before a baghouse. (November 6, 2000 Union comments, p. 30.) A water quench or other cooling system is not a technology transfer option for this SCR application. HES considered water quench along with other cooling options but rejected it because any dissolved solids in the water, regardless of concentration, tend to coat the catalyst. (Phone call with John Berger, HES, 847-545-8800.) The need to cool exhaust is a function of the percent of time that the exhaust will be hot enough to be of danger to the catalyst. Very little if any liquid water can be tolerated by the catalyst. Even if technically feasible, operating cost associated with the water treatment would need to be considered, and water quench could actually be more expensive than dilution air. SDI's source of water is much deeper than the well water tested by the Union as shown in their Exhibit 16, and IDEM does not agree with the Union claim that SDI can use the shallow well water or that no water treatment would be required. Water quench before SCR is not technically feasible. In addition, HES' decision to use air dilution is supported by other SCR installations. The Union itself states that the Corus SCR uses dilution air. (Dec. 21, 2000 Union comments, p. 3.) The USS Posco project cited by the Union uses dilution air. (Phone call with Steven Del Mar, 925-439-6000.) An SCR installed by Hitachi-Zosen apparently uses dilution air to bring the exhaust gas temperatures to the range needed for the SCR to operate properly. (Nov. 6, 2000 Union comments, p. 41.) It is reasonable for HES to use dilution air for cooling. Based on the design provided in its bid, it is also clear that the dilution air is added at the very end of the plenum, not before, demonstrating the size of the plenum is not significantly affected by the

presence of dilution air.[44] It is unreasonable to believe that the Union knows more about SCR design than the vendor. The $452,000 water quench cooling system credit claimed by the Union will not be removed from the SCR costs, and the Union's 34% reductions claimed on lower lines will not be accepted. Similarly, the Union's unsupported claims that a second/larger recuperator or a waste heat boiler could be used cost effectively are unreasonable and are rejected. IDEM will not reduce Line 1 by the $452,000 claimed in the Union's estimate.

The Union is correct in their assertion that, if a single stack is used, only one set of fans will be required. There would also be some additional ducting required but the Union does not include realistic ducting costs in their estimate. As mentioned earlier, IDEM does not agree with the Union's logic that only one stack is needed but will go along with their claim in this calculation. The Union does admit that some additional fan cost is attributable to the SCR. HES assigned $200,000 (Line 2) for rotating equipment. The Union states that the fan is $175,000 of the $200,000 cost and then estimates the SCR's back pressure will only be 10% of the fan cost. Ten percent of $175,000 is $17,500, so the Union should have subtracted $157,500 instead of $158,000. IDEM believes the Union's estimate of cost savings for ID fans is probably too high, but for the sake of argument, IDEM will reduce Line 2 by $157,500 for shared stack fans.

SDI split the Auxiliaries: Reheat Furnace Integration w/SCR into equipment (Line 9) and installation cost (Line 18). Some integration is always required for any transition from an emission unit to a control device, and SDI's reheat furnace is no exception. IDEM disagrees with the Union claim that the SCR is poorly designed or that the furnace is already installed. The Union is also incorrect in claiming that the program logic control (PLC) is not tied into the SCR. (Nov. 6, 2000 Union comments, pp. 29 and 33.) In fact, the PLC tie-in is an integration item added to SDI's system that was not in Beta's. (September 27, 2000 TSD Attachment B-5.) For argument's sake, IDEM will use the Union's cost estimate of $31,731. Therefore, Line 9 will be changed to $31,731 and Line 18 will be zeroed out.

Incorporating the changes stated above, the Line 12 adjusted purchased equipment cost (PE) comes to $2,323,003 from the original SDI value of $3,045,649.

Response to Comments on Direct Installation Costs (DI) (Lines 13 - 22)
The Union eliminated the insulation credit (Line 17) of $128,000, removed the Auxiliaries: Reheat Furnace Integration w/SCR cost (Line 18) from the direct installation cost ($151,351) and revised the site preparation cost (Line 20) from $34,444 to $9,444. The Union reduced the total direct installation cost (Line 21) from $1,448,702 to $1,400,914.

The insulation savings are reasonable and directly attributable to the SCR. Union comments prior to the remand associated the Beta Steel operational problems with fiber insulation plugging the catalyst. The location of the fiber insulation within the furnace is not critical; it is the presence or absence of fiber insulation for catalyst plugging. The Corus example cited by the Union has no fiber insulation in the furnaces. (Phone call with Laurens Nuninga, Corus, 31-2514-98642.) The Union points to no example where any other insulation method is used and offers no realistic insulation option. Cast-in-place (CIP) refractory is held on the walking beam post by multiple steel brackets welded on the post which become imbedded in the CIP as it is cast around the post. Even with the anchor system, the CIP does not last indefinitely. Contrary to the Union's claim, fiber sheets cannot be attached with the welded-on brackets in the way, and CIP cannot be fastened to post with fiber in the way. (Phone call with Anthony Fennell,

[44] The Union offers a calculation to claim that the plenum is oversized because of the use of dilution air. IDEM disagrees that the calculation on page 32 of the November 6, 2000 Union comments, which mistakenly refers to Kelvin instead of Rankin temperature, reflects an oversized plenum. IDEM also notes that the Union claims a water quench system would reduce the volume of gas to be treated by 66% (pages 35 and 36), but the Union's numbers show a 34% reduction.

Bloom Engineering, 330-467-3389.) IDEM disagrees that there should be any change to this cost or the fuel adjustment charge shown on Line 43. The credit for the post insulation on Line 17 (-$128,563) will remain.

As stated above, IDEM accepted the Union's claimed SCR integration costs on Line 9 for purposes of this calculation and will zero out Line 18. IDEM will reduce Line 18 by the $151,351.

The Union removed $25,000 for an access road. This short road is needed to allow a truck to get to the SCR to unload ammonia. The $25,000 for a paved road to the ammonia storage tank is used for engineering, to cut the path and drainage ditches, grade, install base material and compact it, and blacktop the road. The Union is wrong when it claims on page 37 of their November 6, 2000 comments that HES already included the cost of an access road in the HES bid. (September 27, 2000 TSD Attachment B-1, Tab B.) The Union also cites a price for large asphalt paving projects where a three and a half inch coating is applied to an existing base. IDEM notes that the Union did not include any cost in their estimate for the access road, even though the Union agreed there would be some cost. A three and a half inch asphalt road without a proper base would buckle under the weight of a truck. No change in the Line 20 road estimate will be made. The SDI Line 20 cost of $34,444 will remain.

IDEM's Line 21 Direct Installation Cost is $1,297,351. This results in a revised Line 22 Total Direct Cost of $3,620,354.

Response to Comments on Indirect Capital Costs (IC) (Lines 23 - 33)

The Union estimate reduced the construction and field expenses (Line 24) from $30,000 to $9,600, determined that a process safety management plan (Line 29) was not required for another reduction of $18,000 and removed the contingencies cost (Line 30) of $91,369. These reductions changed the Union's indirect capital costs (Line 31) from $522,769 to $393,000.

The Union previously stated on page 7 of their June 30, 1999 comments that the total for engineering, supervision, construction and field expenses (Lines 23 and 24) should not exceed 10% of the purchased equipment cost, even though the EPA-OAQPS Manual allows 20% of the PE cost. Ten percent of SDI's PE costs would be $304,565, and 20% would be $609,130. SDI's total cost for these items ($233,400) is almost exactly the 10% (based on IDEM revised costs) the Union stated was reasonable. The Union has not provided any valid justification to change their previous position and cut construction and field expenses even more, especially where SDI submitted an actual bid for these costs. IDEM will not cut construction and field expenses. Line 24 will remain $30,000.

IDEM agrees with the Union that the cost for preparation of a Process Safety Management Plan is not warranted but not for the same reason as the Union. The need for a Process Safety Management Plan is an Occupational Safety & Health Administration (OSHA) requirement. The rule cite given by the Union (40 CFR 68.130) pertains to an EPA requirement relating to Risk Management Plans. SDI did not include cost for a Risk Management Plan. The Process Safety Management requirement is not applicable because the ammonia percentage by weight that would be used by SDI (19%) is less than the 44% ammonia by weight trigger for the OSHA requirement. This Line 29 $18,000 cost will be removed as there is no Process Safety Management requirement specific to the SCR.

Even though there is comparatively little engineering experience with an SCR on a reheat furnace, the Union claims that there should be no contingency costs in SDI's calculation. The EPA-OAQPS Manual includes contingency costs in cost effectiveness analyses to account for unanticipated expenses (20% is common for new construction). Beta Steel is the only company in the United States with an SCR on a reheat furnace, and IDEM believes that the Union will agree there have been unanticipated problems with Beta's installation. Further, IDEM is aware of no other project that does not include contingencies, and the Union gives no examples of projects where contingencies are not included. The Union's own

Exhibit 24, Tables A-5 through A-8 show 3% contingencies. IDEM believes a contingency cost of 3% as proposed by SDI is reasonable and perhaps understated given this particular application. With IDEM's cost revisions shown on lines above, Line 30 is recalculated at 3% of Line 12 and is now $69,690 ($2,323,003 x 0.03).

IDEM will revise the Line 31 Total Indirect Capital Cost from $522,769 to $483,090. The resulting Line 32 Total Capital Investment is now $4,103,444.

As stated earlier, Beta Steel is the only source in the United States that uses SCR on a reheat furnace. Beta Steel has operated this SCR for only four years. The Corus mill in Holland cited by the Union has two walking beam reheat furnaces with SCRs that were installed only two years ago and one pusher type reheat furnace with an SCR that was installed in September 2000. So, there is limited operational data on the lifetime of an SCR on a reheat furnace. In her California Comments, Dr. Fox relied on an exhibit (May 8, 2000 Goal Line cost analysis) using a 10 year depreciation period for both SCR and SCONOx. IDEM's September 27, 2000 TSD Attachment B-7, Tabs C & D shows that the IPSCO-Muscatine Project in Iowa and the Chaparral Project in Virginia both used a 10 year lifetime for the SCR. And, Dr. Fox's California Comments mention on pages 19, 21 and 38 that corrosion problems would not support a 20 year SCR lifetime for a turbine installation. The use of ten years for SCR life is within the EPA-OAQPS Manual range for depreciation. The Union claims that two SCR vendors (Mitsubishi Heavy Industries and Hitachi-Zosen) support their position of a 20 year lifetime, yet both of these vendors declined to bid on the SDI SCR. The 10 year depreciation period is reasonable, and IDEM sees no basis to change it. The capital recovery factor on Line 33 is unchanged at 7% interest over a 10 year lifetime (0.1424). Because earlier lines were changed, IDEM's Line 33 is calculated to be $584,330 (Line 32 x 0.1424).

Response to Comments on Operation and Maintenance Costs (O&M) (Lines 34 - 49)
The Union revised direct annual costs (Line 44) from $724,765 to $258,734 by reducing cost for operator (Line 34), supervisor (Line 35), maintenance labor (Line 36), maintenance material (Line 37), catalyst replacement & disposal (Line 39) and electricity costs (Line 42). Indirect annual costs (Line 47) were revised from $298,202 to $50,316 through reductions in the costs for overhead (Line 45), property tax, insurance and administration (Lines 46a, 46b, 46c).

The EPA-OAQPS Manual provides percentages for the supervisor (Line 35), maintenance labor (Line 36), and maintenance material (Line 37) cost based on the operator (Line 34) cost. Supervisory costs equal 15% operator costs, maintenance labor equals 110% operator labor, and maintenance materials equal 100% of maintenance labor costs as spelled out on page 2-24 of the EPA-OAQPS Manual. Regarding the operator costs (line 34), SDI does not employ people at the lower salary range given by the Union, and inflation will only increase the operator cost over time.[45] The Union's own Exhibit 24, Tables A-4 through A-8 use $25 an hour for operator pay in 1999, yet the Union chose to use $16.78 in their current estimate. In their November 6, 2000 comments, the Union also reduces time per shift to half an hour based on experience at steadier-state processes, yet in the Union's June 30, 1999 comments on page 7, they state that 0.5 full-time operators (12 hours) is typical for a large SCR system. Beta spends more than two hours a day on SCR. (Phone call with Joseph Gazarkiewicz, Beta Steel, 219-787-8200.) IDEM believes that the SDI operator cost is reasonable. Lines 34, 35, 36, and 37 will not be changed from the SDI estimate.

The Union uses six years as an estimate for catalyst life in their cost analysis. Pages B.32-B.34 of the NSR Workshop Manual explicitly state that design parameters such as catalyst life are to be supplied by the vendor. HES set the catalyst life guarantee at two years. In the California Comments on page 19,

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[45] SDI is required for its economic incentives to have an average hourly wage well above the wage offered by the Union. Section 5 below contains further explanation on economic incentives.

Dr. Fox speaks of SCR catalyst replacement every three years, and on page 39 she talks about a catalyst change out frequency of once or twice per year, depending on the stringency of permit limits. The Union also refers to the USS Posco SCR in their November 6, 2000 comments, but this SCR catalyst is replaced every 2-3 years. (Phone call with Steven Del Mar, USS Posco, 925-439-6000.) The Beta SCR catalyst has operated for four years (phone call with Joseph Gazarkiewicz, Beta Steel, 219-787-8200), and the latest Beta Steel NOx test done in November 1999 showed a result of 18.89 lbs NOx/hour, a four-fold increase from their March 1999 NOx test result and six times higher than their present NOx permit limit. Due to the limited amount of operational data for an SCR on a reheat furnace, IDEM does not see any reason to change the vendor's supplied parameter for catalyst replacement. The Union also reduced the catalyst size and cost by 34% based on their water quench proposal. As explained above, the Union's water quench system claim is not reasonable. Line 39 will remain at the SDI estimate of $121,549.

The Union reduced electricity cost (Line 42) by 34% based on the use of a water quench system. As stated earlier, IDEM does not believe a water quench system is technically feasible, so the 34% reduction is not factored in. Also, SDI uses 4.5 cents per kilowatt hour for electricity costs versus 3.5 cents per kilowatt hour proposed by the Union. IDEM believes that speculating on the ability of SDI to be able to negotiate a long term electricity supply contract for a lower rate is unreasonable. The U.S. Department of Energy[46] lists the average cost for electricity for Indiana at 5.5 cents per kilowatt hour. The Union's Exhibit 24, Tables A-4 through A-8 use 6.0 cents per kilowatt hour. The SDI estimate of 4.5 cents is the average of the Union estimate and the U.S. Department of Energy cost and is considered to be reasonable by IDEM. Next, the Union reduced the brake horse power (bhp) level from the 347 bhp used by SDI to 70 bhp, which tends to be the medium case. HES provided the 347 bhp design-level electricity usage. If the bhp is reduced to the medium case, then the amount of NOx tons produced per year should be reduced to the medium case as well. Even considering the reduced cost from lowered ammonia consumption, the overall cost per ton for SCR control would dramatically increase. IDEM will not reduce the NOx tonnage per year but, for the sake of argument, IDEM will recalculate this cost using the Union's 70 bhp case. (70 bhp)(0.746 kw/bhp)(8760 hr/yr)($0.045/kwh) = $20,585. Line 42 is reduced from the SDI estimate of $102,043 to $20,585.

The Union claims that SDI's miscellaneous costs (duct cleaning, fuel adjustment charge) are not valid. Page B.29 of the NSR Workshop Manual requires energy penalties to be considered in the cost analysis. IDEM believes that the fuel adjustment charge is fair given the removal of fiber insulation used in the furnace. Additionally, SDI used only 8400 hours instead of 8760 hours for calculating the fuel adjustment charge and natural gas prices have since almost doubled (www.nymex.com), so SDI has underestimated the real costs. IDEM does not believe that a downward change in fuel costs is warranted. SDI included the cost for duct cleaning twice per year to avoid catalyst plugging. Because the fiber insulation has been removed, IDEM is not sure that duct cleaning is needed solely for the SCR or that two cleanings is necessarily correct. However, IDEM will not remove the costs of the two cleanings ($5474.00) because SDI improperly excluded the costs of catalyst washing from its cost per ton calculation. IDEM believes that the Union would agree that catalyst washing would be required. Pages 4, 16, 18, 19, 23 and 24 of Dr. Fox's California Comments acknowledge that cleaning is required. For SCONOx at Elk Hills, Dr. Fox included an annual catalyst cleaning cost of $210,000 per year based on a five year contract. IDEM believes that $5474.00 is probably too low for SCR catalyst cleaning but will use that figure. Line 43 remains $152,474.

With the above changes, the Line 44 direct annual costs are reduced from $724,765 to $643,306.

The Line 45 overhead cost is calculated based on 60% of the sum of Lines 34, 35, 36 and 37. IDEM did

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[46] U.S. Department of Energy - Energy Information Administration, Electric Power Annual, 1998, Volume 1, April, 1999.

not revise the SDI estimate for these lines as mentioned above. Line 45 is therefore unchanged from the SDI estimate of $97,517.

The SDI estimate combined administration, property tax and insurance costs on Line 46 and used 4% of total capital investment. This is the method specified on page 2-27 of the EPA-OAQPS Manual. The Union's Exhibit 24, Tables A-4 through A-8 uses the same method as SDI. However, the Union estimate broke these costs out individually and reduced them in Lines 46a (1% for insurance), 46b (0.25 x Lines 34 and 35), and 46c ($0 for property taxes). The Union's administrative costs ($1761 in Line 46b), which are based on a formula for rough estimating administrative costs for an entire plant, are not reasonable for the relatively large investment of an SCR. The Union is correct that SDI can apply for property tax exemption (Line 46c) on pollution control equipment, but this is not automatically granted. For the sake of argument, IDEM will use 2% for Lines 46a, 46b and 46c combined instead of the 4% recommended by EPA-OAQPS Manual. Line 46a is calculated by taking 2% and multiplying it by the Line 32 capital investment cost ($4,103,444 x 0.02 = $82,069). Line 46a is reduced from the SDI cost of $200,685 to $82,069.

Line 47 total indirect annual cost is revised from $298,202 to $179,586.

Line 48 total operation and maintenance cost is revised from $1,022,967 to $822,892.

Line 49 total annual capital and O&M costs is revised from $1,737,292 to $1,407,222.

Response to Comments on Annual Cost Effectiveness (Lines 50-52)
The Union also suggests increasing the baseline NOx emissions based on HES' design basis figure. It appears to IDEM that the slightly higher value used by HES is a rounding difference, is not significant and would not affect the SCR design cost. The theoretical maximum heat input rating for the reheat furnace was previously given at 373 MMBtu/hr, but the nominal heat input rating for the reheat furnace is actually 260 MMBtu/hr. Given the medium and low load cases which will occur with SDI's frequent roll and product changes, the baseline NOx tons of 125.3 tons per year is probably too high. A lower amount of NOx tons per year would raise the cost of removal per ton. However, to alleviate the Union's concern, IDEM will revise the permit and include a permit condition limiting SDI's heat input to 260 MMBtu/hr through monthly fuel consumption monitoring. Attachment A shows the revised permit condition. There will be no change to the Line 50 baseline NOx emissions.

To justify their use of 90% NOx control, the Union claims that the Corus SCRs achieve 85+% control on its hot strip mill reheat furnaces. However, the Union's own Exhibit 10 shows that only 60% NOx removal is required. Corus informed us that control levels are often from 60%-80% removal, varying with product and flue gas changes. (Phone call with Laurens Nuninga, Corus, 31-2514-98642.) Because SDI would produce structural steel instead of slabs, SDI's product and flue gas variations will be much greater. The Beta permit requires 85% removal but Beta has never achieved this. In the Union's Exhibit 24, even the SCRs for turbines are calculated at only 79% NOx removal. Pages 34 and 35 of Dr. Fox's California Comments also use 80% NOx control for both SCONOx and SCR on a steadier-state turbine. IDEM believes that 80% reduction is realistic for the SDI SCR cost analysis.[47] Line 51 will be based on 80% removal efficiency.

Revising the cost analysis based on the Union's and COW's comments yields a cost per ton for NOx removal (Line 52) of approximately $14,044. Considering previous regulatory decisions regarding reheat furnaces, $14,044 is disproportionately higher than the cost to control NOx for any recent BACT determination. Again, this cost is economically infeasible and consistent with IDEM's original

[47] While IDEM does not agree with the Union's argument, even at 90% control the cost is economically infeasible.

determination.

(C) Cost Comparison to Other NOx Control Technologies

As part of the July 7, 1999 permit decision, IDEM found that SCR and selective noncatalytic reduction (SNCR) were economically infeasible and that NSCR and all other NOx controls are technically infeasible. These determinations are consistent with BACT decisions made on other mills in the country. No one, including the Union and COW, submitted comments before the remand discussing NOx control options other than SCR. In the Board's June 22, 2000 decision, it is noted that SNCR's economic infeasibility was based on a cost per ton rough estimate of $5300-$5700 and that IDEM should revisit SNCR to determine whether it is a feasible control for SDI's reheat furnace. The Board also assumed that NSCR was found to be technically infeasible but noted that IDEM did not directly write about the infeasibility of NSCR in the July 7, 1999 addendum. To address these items, the Board directed IDEM to consider the costs of viable NOx control options other than SCR, if there are any.

The remand directed IDEM to perform a complete analysis of SCR cost-effectiveness, including comparisons of cost to other facilities and to other technologies. IDEM provided the table entitled "Reheat Furnace NOx BACT Comparison Chart" on page 20 of 26 of the September 27, 2000 Remand Technical Support Document. This chart discusses NOx control technologies for SDI's reheat furnace and other mills and lists the determinations made in each case for the technologies considered, including SCR, SNCR, NSCR, FGR/EGR and SCONOx. In all cases these other NOx control technologies were considered technically or economically infeasible.

The Union now claims that SNCR and SCONOx, a proprietary nonselective catalytic reduction technology, are technically and economically feasible. The Union made no comments on SNCR or SCONOx before the remand. In addition, the Union's November 27, 2000 and December 21, 2000 comments which raised SNCR for the first time were not submitted until after the comment period had ended. Finally, it is IDEM's understanding that SCONOx is described as an NSCR-type technology, and NSCR was already found to be infeasible as part of the July 7, 1999 permit decision. These arguments are waived. However, IDEM will provide explanations as to why SNCR and SCONOx are not BACT for the reheat furnace.

Response to Comments on SNCR

Before the remand, the cost per ton figures for SNCR were based on general information about SNCR costs. SNCR is often not considered to be a top option as compared to SCR, especially where NOx inlet concentrations are already low. Therefore, SDI did not previously seek an actual vendor bid for SNCR. After remand, SDI asked two different vendors (Wheelabrator and HES) to provide bids on SNCR for the reheat furnace. Both vendors found that SNCR was infeasible for SDI's reheat furnace. The vendors determined that SNCR is infeasible because the optimal operating temperature for SNCR (maintained above 1800 degrees F) is higher than the exhaust temperature from the reheat furnace (963-1900 degrees F without recuperator, 535-1173 degrees F with recuperator). Under most operating conditions, the exhaust temperature would be well below 1800 degrees F. Extra natural gas must be burned to raise the flue gas temperature when the temperature is below 1800 degrees and to compensate for the heat recovery which a recuperator would normally provide. The extra fuel burned would introduce more NOx in the exhaust. If temperatures were too low, NOx would not be controlled and excessive ammonia slip would occur. It was also noted that the rate of change in flue gas volume and composition would be difficult to control and that SNCR is much less efficient at destroying NOx than SCR. Documentation of those determinations was provided in Attachment B-3 of the September 27, 2000 Technical Support Document.

In their November 27, 2000 and December 21, 2000 comments the Union mentions that the Avesta

Sheffield stainless steel mill in Sweden recently installed SNCRs on two reheat furnaces. According to the Union's comments, the NOx limit there is 0.23 lb NOx/MMBtu, which is more than double the limit already in SDI's permit (0.11 lb NOx/MMBtu achieved by using low-NOx burners). The Union states that Avesta's average exhaust temperature is 2200 degrees F, which is much higher than SDI's exhaust temperature. The higher temperature is critical to SNCR performance. The Union's documentation also shows that control efficiencies are only 10-30% on one furnace and 70% on another furnace. The lower control efficiency is reportedly due to lower inlet NOx concentration, which likewise would be the case at SDI with low NOx burners. IDEM notes that Avesta produces stainless steel, not carbon steel like SDI, and uses different fuels in their reheat furnaces than SDI. SNCR is not technically feasible in this reheat furnace application.

Once a technology is found to be technically infeasible, cost information from another facility is not relevant. The Union offers some limited capital investment information but does not explain the basis for the figures, how they estimated the other costs like O&M or how they arrived at their cost per ton. The Union's information does indicate a five-year depreciation period for the system, though, which is much shorter than the ten-year period SDI used for the SCR cost analysis.

Two vendors determined that SNCR was not appropriate for SDI's reheat furnace. The information submitted by the Union does not change the finding of technical infeasibility here. SNCR is eliminated as a control option.

Response to Comments on SCONOx

The Union also submitted information on SCONOx. SCONOx is a product of Goal Line Environmental Technologies which uses a catalyst but no ammonia to reduce NOx and potentially other emissions. The Union apparently contacted Goal Line to ask for a proposal for SDI's reheat furnace. The Union included that proposal in Exhibit 42 of their November 6, 2000 comments.

SCONOx has been used on a 32 MW combined-cycle turbine in Los Angeles, California and a 5 MW combined-cycle turbine in Andover, Massachusetts. Both turbines are in serious or severe nonattainment areas for ozone. As the Union's November 6, 2000 exhibits show, SCONOx has been discussed as a possible control option on additional turbines as well. The Union's Exhibit 40 notes that U.S. EPA Region I believes SCONOx should be considered commercially available for large combined cycle gas-fired turbines. Region I's determination does not state that SCONOx is commercially available for reheat furnaces, and even if it were commercially available, SCONOx would still need to be found applicable and cost effective to be BACT for SDI's reheat furnace. SCONOx has never been installed on any reheat furnace. Turbines are considered to be much steadier-state than a reheat furnace. Flue gas characteristics for a reheat furnace vary significantly in the matter of a few minutes. The greatest variation for turbines is during start up and shut down with other periods showing much steadier operation. Exhibit 36 of the Union's comments contains a 21,000 hour performance report on SCONOx operation at a turbine and demonstrates that flue gas fluctuations were minimal.

As noted earlier, SCONOx has never been operated on a reheat furnace. IDEM does not believe that the reheat furnace and a turbine are similar sources. The Union's Exhibit 44 of the November 6, 2000 comments discussing gas composition from a turbine does not reflect the variability which a reheat furnace producing structural steel will experience. SCONOx is not applicable to the reheat furnace and has not been demonstrated on an identical or similar source. Therefore, SCONOx is not technically feasible and is eliminated as a BACT NOx control option.

Even if SCONOx were technically feasible in this application, it would not be economically feasible. Page 12 of the Goal Line proposal specifically excludes several items needed for SCONOx, including system wiring and piping interconnections, foundations and site construction, catalyst washing and recoating, transition ducting and stack, insulation, temperature reduction system, catalyst installation,

mechanical system installation and expansion joints. SCONOx also needs a natural gas supply, hydrogen and a carrier gas such as steam. Steam is readily available at a combined-cycle turbine, but a steel mini-mill does not use steam in its processes. On page 13 of Goal Line's proposal, all utilities costs are excluded as well. Goal Line states that an ID fan is needed to overcome the pressure drop caused by SCONOx but does not include it in the proposal. On page 15 Goal Line states that the exhaust gas velocity distribution must be extremely smooth before it enters the SCONOx system for proper operation. The ducting required to produce near laminar air flow would be similar in length to the plenum included in HES' firm SCR bid. All of these expenses are not part of the Goal Line proposal and would raise the cost even more.

Additionally, Goal Line's proposal contains several limitations. Importantly, the proposal does not contain the design basis, pricing for major components, drawings, warranty or any of the other attachments listed on page 21 of the proposal. The Union criticized the original SCR bids prepared for the July 7, 1999 decision because these kinds of information were not provided. The Goal Line proposal does not include any information specific to SDI's reheat furnace, instead using more generalized information from other sources. IDEM notes that Goal Line references a heat recovery steam generator (HRSG) on page 12. SDI's reheat furnace has no HRSG, but combined-cycle turbines do have HRSGs. Goal Line states that the ideal temperature is from 300-700 degrees F. A temperature reduction system is not included in the proposal's cost but would be required. The proposal also states that SCONOx systems typically have five to fifteen sections of catalyst with 20% shut off by louvers and in the regeneration cycle at any one time. This proposal is for the smallest size SCONOx of five chambers. There is no justification in the Goal Line proposal for this SCONOx size. Page 3-8 of Union Exhibit 24 shows that a larger SCONOx would add much more cost.

The Goal Line proposal's price for the incomplete SCONOx system is $2,805,906. The Union did not provide an analysis of SCONOx cost effectiveness, but it is apparent from the proposal that SCONOx is higher than the cost for SCR on the reheat furnace, taking into account the items excluded by Goal Line. The Union's own Exhibit 24 dealing with turbine installations notes that SCONOx is typically two to three times higher in cost than SCR. SCONOx is eliminated as a control option for the reheat furnace.

Response to Other Comments on NOx Control Technologies

Mr. Davis asked if IDEM checked other venues in the United States and overseas to look for best available control technology or did IDEM get this data strictly from Steel Dynamics. Also are there any data from other vendors and why are those data not in the permit?

IDEM checks the U.S. EPA RACT/BACT/LAER Clearinghouse (RBLC) database for BACT decisions throughout the United States and compares this to the applicant's BACT. If a more stringent BACT limit is found than that proposed by the applicant, the applicant is required to explain why their facility cannot meet this more stringent limit. Information on technology applications in other countries is limited and virtually no detailed and reliable cost information is available. Nevertheless, IDEM has gathered information and has received information from commenters on sources outside the country and has considered that information in this permit decision. SDI will meet BACT for the reheat furnace.

As explained earlier, other vendors declined to bid on control devices for SDI's reheat furnace. If a vendor declines to bid on a control device, IDEM does not have the authority to tell the vendor that the control is technically feasible and they must therefore submit a bid. The bids received for the project were included with the original permit support documentation. IDEM does contact vendors when appropriate to better understand a specific technology or bid. Regarding steel mills, Indiana is the leading steel producer in the country, and the other states within EPA Region V have a number of mills as well. Therefore, IDEM has particular expertise in this area and U.S. EPA provides additional guidance to the states on steel mill regulation.

(D) SCR Cost Comparison to Other Facilities

Mr. Kille stated that he believes that the remand required IDEM to compare cost to other facilities and to other technologies.

Mr. Kille is correct. IDEM addressed these issues of the remand in the September 27, 2000 Technical Support Document. Section B.3 of the Technical Support Document, on pages 19 through 21 contains a table showing cost comparisons between the steel mills the EAB instructed IDEM to compare. No comments were submitted challenging the analysis performed to compare the SDI decision with other steel mill BACT determinations. The Union did submit limited comments on comparing SDI to Beta and on the cost at Corus.[48]

The Union makes the argument that the SDI SCR cost is excessive (estimated at 35% to 38% higher than Beta) because of SDI's large refractory lined plenum/duct, a feed-forward control system and a data highway. The Union reduced these and other costs in their revised cost per ton estimate and concluded that the Beta system and the SDI system would cost about the same. The Union then claims that O&M costs would be lower at SDI and that 35-38% higher cost is not significant under BACT anyway. The Union's written comments also state that IDEM failed to identify and review foreign SCR installations and that there are recent developments here in the United States that are relevant and were not discussed by IDEM. To support their position the Union cites SCR installations in The Netherlands and elsewhere. They also pointed out the USEPA is requiring an SCR on a walking beam furnace in Darlington, South Carolina as part of a global settlement with Nucor Steel.

COW also claims that IDEM's BACT analysis lacks any reference to foreign application of SCR and makes claims that there are successfully applied SCRs to reheat furnaces in The Netherlands and other countries.

Regarding Beta, the Union takes the following quote from the NSR Manual: "if the cost of reducing emissions with the top control alternative, expressed in dollars per ton, is on the same order as the cost previously borne by other sources of the same type in applying that control alternative, the alternative should be initially considered economically achievable, and therefore acceptable as BACT." The Union further states that "This criterion is met here because SCR is currently in use on the Beta reheat furnace and the costs of the two systems are of the same order." However, in the next paragraph of the Union's comments the Union states that there was no cost effectiveness analysis for the Beta system. IDEM agrees that no reliable cost data is available for the Beta SCR installation and operation. Beta did not include a calculation for a cost per ton removal since they were installing what was considered at the time to be the top control option. Even if IDEM were to accept that the Beta system and SDI system cost about the same, the quote from the NSR Manual is regarding the cost of reducing emissions in dollars per ton. This is not the same as the cost of the systems for which the Union makes their argument. Finally, it has been demonstrated that the structural steel product variability at SDI will cause even more flue gas fluctuations at SDI than Beta has in reheating their more uniform slabs. The Union has erroneously applied the NSR manual criterion in their analysis.

Regarding SCR abroad, IDEM did not make an adverse determination on the technical feasibility of SCR on reheat furnaces, only the economic feasibility.[49] There is no detailed and reliable cost information for the foreign SCR installations. The Union's December 21, 2000 comments claim that Corus spent

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[48] The Corus cost information was dated December 21, 2000, and received December 27, 2000, long after the comment period ended.

[49] The foreign sources acknowledged having problems (monitoring NOx and controlling temperature of the flue gas) with the installation. Union November 6, 2000 Exhibit 10.

around $2000 per ton on NOx removed. The whole cost discussion is only a paragraph long and no detail is given to support the calculation. Because the Union only mentions certain capital costs, it is unclear whether all of the necessary SCR costs were included for a cost effectiveness analysis. The Union's own Exhibit 10 in their November 6, 2000 comments states that the Corus SCR cost was to be subsidized by the government. Corus also has a much (over three times) higher NOx baseline for calculating cost per ton. Further, Corus is a hot strip mill, somewhat similar to Beta. Unlike the slabs at Corus and Beta, SDI's structural steel products are highly variable in size and shape and require frequent roll changes to produce the small tonnage orders typical for structural steel. The resulting flue gas variability from SDI's operation would make the Corus SCR example substantially different from SDI.

Regarding the Nucor – Darlington, South Carolina settlement with USEPA, the consent decree was made available to the public on December 19, 2000.[50] Three points should be stressed regarding this settlement. First, the Nucor settlement concerned an enforcement action, not a BACT determination. Secondly, the Nucor consent decree refers to SCR and other potential control technologies as "pilot projects," and thirdly, the Nucor consent decree sets the level at which a pilot program is economically infeasible at $10,000. The cost of additional NOx control for the reheat furnace at SDI is well above the cutoff U.S. EPA imposed on Nucor through the enforcement action.

IDEM Closing Statement on Control of NOx Emissions from the Reheat Furnace

The final decision on economic feasibility rests with IDEM. BACT is a case by case determination and what has been done at similar facilities is part of that determination. IDEM has appropriately used information supplied by vendors, who work with the steel industry and have highly relevant experience. As Dr. Fox herself notes in her California Comments, vendors costs are more accurate and the vendor estimates of capital and operating costs are more reliable than those presented by other parties. None of the economic analysis for other steel mills in this country have found SCR to be economically feasible. This is documented in IDEM's Technical Support Document on the remand issues on page 20 of 26.

The Union and COW seem to believe that SDI should be treated differently than other mills. IDEM revised the SDI cost analysis based on the Union's and COW's attempt to redesign the SCR and, for the sake of this calculation, reduced or eliminated many of SDI's costs. IDEM's cost analysis yields a removal cost of $14,044. This still resulted in a removal cost that is economically infeasible. IDEM has reviewed all of the information obtained on the economic consideration associated with the real-world application of SCR on a reheat furnace. It is clear that SCR is not an economically feasible control option for the reheat furnace at the proposed SDI – Whitley County facility. Through all of this neither the Union nor COW has pointed to an SCR on a reheat furnace making structural steel. An SCR for SDI's reheat furnace is economically infeasible.

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[50] Published at www.usdoj.gov/enrd/nucorcd.htm

3. NOx and CO BACT Format for the Electric Arc Furnace (EAF)

As part of the remand, the Environmental Appeals Board stated that IDEM was required to reconsider the BACT limitations chosen for NOx and CO emissions from the EAF. IDEM must explain why the limits it imposed are in lbs/hr (rather than in lbs/hr and lbs/ton, or lbs/ton alone), in particular explaining the differences (if any) between SDI's proposed mill and the fifteen similar mills that would justify exclusive lbs/hr limits for CO and NOx. Alternatively, IDEM is ordered to impose production limits in addition to the hourly limits for these pollutants.[51]

In response to the remand, IDEM revised the BACT for NOx and CO emissions in Condition D.1.2 to include both pounds per hour and pounds per ton limits. Therefore, IDEM fulfilled the obligations of this remand issue and as a result, no public comment period on these emission limits was required. Regardless, the Union, through their consultant Dr. Fox, provided comments regarding OAM's NOx emission limits from the meltshop. Other people also provided comments. IDEM believes that it is not required to address these comments since IDEM has already fulfilled the obligations of this remand issue. Regardless, IDEM provides the following responses.

Comment: The revised NOx emission limit is not enforceable and is not the lowest achievable limit. The new NOx emission limit of 0.51 pounds per hour is higher than limits that have been achieved at other steel mills in Indiana. The most recent source test at Beta Steel, for example, demonstrates that NOx emissions ranged from 0.12 pounds per ton to 0.31 pounds per ton. Therefore, IDEM should lower the proposed limit to be consistent with current practice at Beta Steel. Compliance with the 3-hour block average can only be determined by use of a continuous emission monitor (CEM). IDEM has not sufficiently documented why a CEM is not feasible. Dr. Fox believes that a CEM is feasible and should be required to demonstrate compliance. Stack testing should be required more often than once every five years.

Response: The EAB required that IDEM "explain why the limits it imposed are in lbs/hr," or in the alternative, "impose production limits in addition to the hourly limits for these pollutants." The revised NOx emission limit retains the lbs/hr limit and imposes an additional lbs/ton production limit. The allowable emissions did not increase with the addition of this new lb/ton limit; rather the lb/ton limit was calculated directly from the lb/hr limit in the original permit. The lb/hr limit has not increased. IDEM, OAM has set the most stringent limits for NOx found anywhere in the country for this type of EAF. Limits for other EAFs are based on three-hour block averages and for many of those sources, compliance was demonstrated by conducting compliance testing. A CEM is not required to show compliance with a 3-hour average; instead, compliance can be demonstrated by the use of a stack test. Stack test protocol requires the use of a federally approved test method over a three-hour period. Also, CEM feasibility was raised by the Union as part of their initial appeal to the EAB; but the EAB dismissed it; therefore, it is not a remand issue. The permit already requires compliance testing for NOx at least once per year until a Title V permit for this source is in effect.[52]

Comment: At least one person asked about the interim NOx limit and why the deadline for

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[51] See the Environmental Appeals Board's Order Granting Review In Part and Denying Review In Part, decided June 22, 2000.

[52] More discussion on this is included in the TSD addendum of the PSD permit CP-183-10097 issued on July 7, 1999, which also addressed these same comments (see, e.g., responses 14 and 26).

compliance with the interim limit was changed from 180 days to 365 days after initial startup. The commenter wanted to know why some changes were made to the permit that weren't associated with the remand. Specifically, the commenter does not believe that the deadline for showing compliance with the interim NOx limit was part of the remand. The commenter also wanted to know why such an extension would be allowed in an area where ozone is a problem.

Response: The board did not specifically direct IDEM to look at the deadlines for compliance with the interim and final NOx limits, but it did direct IDEM to reconsider the NOx limits. The source is required to use oxy-fuel burners and good combustion practices to reduce NOx emissions. In order to achieve good combustion practices, the source needs to be allowed some time to ramp up production and gain experience operating the system. In order to allow for this, the permit does not require compliance with the final NOx BACT limit until 540 days (1.5 years) after initial startup. As shown in the September 27, 2000 Technical Support Document, this is consistent with other permits for sources using good combustion practices to reduce NOx emissions. Rather than have no limit at all for the first 540 days of operation, IDEM determined that it was best to require an interim limit, which would require the source to step down toward the final limit. This would ensure that the source was making progress toward achieving the final limit and would also help to reduce NOx emissions during the first 540 days of operation. In the original permit, the source was required to meet the interim limit within 180 days after initial startup and required to comply with the final limit within 540 days after initial startup. During the comment period IDEM reviewed more permits for other similar sources required to utilize good combustion practices to control NOx emissions. IDEM found that most permits for similar sources did not require interim limits. IDEM also found that generally, sources required to stack test within the first 180 days after startup did not show compliance with their limits; while sources which were given more time (usually more than 365 days) were able to show compliance with their limits. This indicates that the time necessary to ramp up production and gain enough experience to operate the system properly is more than 180 days. After reviewing these other permits, IDEM determined that extending the deadline for compliance with the interim NOx limit would be consistent with other permitting decisions for other facilities using good combustion practices to reduce NOx emissions. The deadline for compliance with the final NOx BACT limit has not changed. All of the changes to the permit are directly linked to the remand issues.

Whitley and Allen Counties are both designated as attainment for ozone; which means that the air in these areas meets the NAAQS with regards to ozone levels. In any event, IDEM is developing a state rule to address the ozone levels in this area and across the state. This rule will reduce statewide NOx emissions by 100,000 tons per year by 2004. The emissions from this particular facility are not of a level that will significantly affect the ozone levels in Allen County. IDEM does not believe that the extension of the deadline for compliance with the interim NOx limit for this source will significantly affect the ozone level in Northeast Indiana.[53]

4. Availability/Completeness of Document

[53] More discussion on this is included in the July 7, 1999 TSD addendum of the PSD permit CP-183-10097, which also addressed these same comments (Responses 2, 12, 2 1, 23, 24, 25, 27, 30, 47, 48, and 53).

Comment: IDEM did not include complete copies of documents attached to the Draft Construction Permit Modification. The papers provided for review are incomplete and deficient, impossible to review, with blank pages, and redundant pages. Various comments were also received from people requesting more time to review the documents and provide comments on the proposed permit.

Response: IDEM, as a policy and in the interest of the public, has gone far beyond the requirements of Indiana and federal law by providing, without request, relevant portions of supporting documentation contained in the administrative record in the public notice package. IDEM also provided references to documents that are part of the administrative record. With regard to these documents, parts of some pages were blanked out because this was the only copy of the document available to IDEM. However, IDEM staff did write the relevant numbers in the blank areas so that the documents did include all of the relevant information. IDEM admits that some pages of one or more documents were accidentally ordered incorrectly, but IDEM did provide the name and telephone number of a contact person who could provide additional information and/or assist someone in sorting through and understanding all of the extra documentation. Whenever anyone did contact IDEM to ask questions or to request more information, IDEM responded promptly by answering questions and supplying any and all requested documentation. EPA Region V also provided additional documentation when requested. IDEM also extended the comment period until November 6, 2000 in order to help accommodate any time constraints in reviewing the proposed permit.

There are no Indiana laws that require that IDEM provide to the public, without a request, all documents that IDEM considers and reviews when issuing a PSD permit. 326 IAC 2-1.1-6(a)(3) states that: "[t]he commissioner shall provide a document supporting the proposed permit or permit revision for public inspection in the offices of the local air pollution control agency or the local health commissioner." Further, there is nothing in the applicable federal rules that require that IDEM provide to the public, without a specific request, all documents that IDEM considers and reviews when issuing a PSD permit. Federal rule 40 CFR 124.6 requires that all draft PSD permits prepared by EPA be accompanied by a fact sheet (§ 124.8) or statement of basis (§ 124.7) and shall be based on the administrative record (§ 124.9), publicly noticed (§ 124.10) and made available for public comment (§ 124.11). In summary, the federal rules, at most, only require the permitting agency to provide copies of the draft permit, technical support document and permit application upon the request of an interested person. Other information contained in the administrative record, including relevant supporting documentation is to be kept available for public inspection. (40 CFR 124.10)

5. Other Comments Not Already Discussed, which were not part of the remand

IDEM notes for the record that the following comments submitted are regarding issues that were not part of the remand. Therefore, either IDEM has already addressed these issues and the Board agreed with IDEM's decision, or they are new issues not within the remand. Therefore, IDEM believes that it is not required to respond to any of these comments. Even so, IDEM believes in its obligation and commitment to all concerns related to the environment; therefore, IDEM provides the following brief responses to comments.

Comment: At least one person has requested a more detailed description of the electric arc furnace

(EAF) system. The commenter wanted to know if there was such a thing as "hot idle" and if so, whether emissions from the hot idle were worked into the requirement.

Response: IDEM believes that the commenter's reference to "hot idle" describes a situation where one furnace has already been tapped except for a heel (a small amount of metal left in the furnace after tapping) which is left to sit in the furnace while it is in idle mode. Additionally the commenter seems to be concerned with the possibility that the other furnace might start operation while the first furnace is in "hot idle." IDEM's emission estimates assume that the furnace is in operation (not in hot idle) at all times in order to produce 200 tons of steel per hour. In any event the permit already contains a condition addressing the commenter's concern.[54]

Comment: At least one person asked who will be responsible for monitoring the emissions from SDI and who will enforce compliance with the limits. People expressed doubts about trusting the results of the testing. People also asked if IDEM warned SDI prior to conducting an inspection.

Response: Both the source and IDEM will be responsible for monitoring the emissions from SDI. The permit includes very detailed monitoring requirements to ensure that control devices are maintained and operated properly at all times when the facility is in operation. The permit requires a continuous opacity monitor and a bag leak detection system to ensure that particulate emissions from the stack do not exceed the limits in the permit. The permit also requires stack testing, which is a direct measurement of the amount of pollutants being emitted from the stack. The source will be responsible for completing the monitoring and stack testing. IDEM will be responsible for reviewing the records of their monitoring, and reviewing the results of the stack testing. Stack testing is required to be conducted according to EPA methodologies. IDEM has staff that are experts in these methodologies. These staff are responsible for reviewing SDI's testing protocols, observing the actual stack tests, and reviewing the results of the stack tests. If IDEM staff do not agree that the testing has been conducted properly, IDEM will require SDI to conduct another test. Additionally, the compliance branch staff at IDEM will be required to review SDI's monitoring records to ensure that monitoring is being done as required and to ensure that there are not excursions from permit requirements. Compliance staff also perform inspections of the plant and other types of surveillance to ensure compliance with the permit limits. Inspections are unannounced. IDEM also has an enforcement office, which is responsible for resolving any noncompliance issues that may arise.

Comment: Commenters expressed concern about SDI's compliance record, stating that there have been many past violations with no action taken by IDEM. They expressed doubt about the likelihood of SDI's new facility complying with the permit. One commenter wants the permit to state "If the plant is not in full compliance with all regulations, OAM will shut the plant down until the defect is corrected." He states that such language has been included before in an asphalt plant permit.

Response: IDEM has taken appropriate action to correct all noncompliance issues that have been identified at SDI's Butler facility. An agreed order was signed on March 24, 2000 to resolve noncompliant stack tests which occurred over the course of approximately three years from 1996 to 1998. This order did include a 41,000 dollar fine as well as a

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[54] More discussion on the design of the furnace is included in the July 7, 1999 TSD addendum of the PSD permit CP-183-10097, which also addressed similar comments (Responses 1 and 38).

requirement to complete a supplemental environmental project (SEP). Completion of the SEP allows the fine to be reduced to approximately eight thousand dollars. The SEP involves the construction and operation of a municipal solid waste recycling and transfer facility at the proposed Whitley County facility. This recycling facility will help SDI divert its cardboard, wood, and metal wastes from disposal at the local landfill. In addition this recycling facility will reduce the need for virgin materials which will reduce energy consumption and the environmental impact of producing these virgin materials. The source has also conducted stack testing which demonstrated compliance with the appropriate limits. IDEM is not presently aware of any other violations regarding SDI's Butler facility.

As previously discussed in this document, IDEM has included many compliance monitoring, stack testing, and record keeping requirements in the permit for SDI's new facility to help ensure continuous compliance with the terms of the permit. IDEM also has a staff of people dedicated to ensuring that sources in Indiana comply with all applicable requirements.

If it is determined that SDI is not in compliance with their permit, then IDEM will take appropriate enforcement action. IDEM does not think that it is reasonable to state that any noncompliance would result in IDEM shutting down the entire plant. Additionally, IDEM believes that the enforcement action taken should be determined based on the violation which occurred. IDEM considers many factors when determining what action is appropriate, including but not limited to the duration of the violation, the environmental impacts resulting from the violation, and the actions taken by the source to correct the violations prior to being required to do so by IDEM.[55]

Comment: One commenter pointed out that Condition D.1.11 should reference Condition C.17 instead of Condition C.18.

Response: IDEM agrees and appreciates the commenter bringing this to IDEM's attention. This error has been corrected in the final permit.

Comment: Commenters have asked about any public money SDI has received and for what purposes.

Response: The OAM contacted the Department of Commerce and obtained the following information:[56]

SDI's Assistance from the State of Indiana is summarized below.

(a) Indiana Training 2000 Program Assistance
Workforce training program which provides partial reimbursement to the company. $400,000 was awarded, $14,500 has been received by SDI.

(b) Industrial Development Infrastructure Assistance
Granted to Whitley County from the state-funded Industrial Development Grant

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[55] More discussion on this is included in the July 7, 1999 TSD addendum of the PSD permit CP-183-10097, which also addressed these same comments (Responses 1, 6, 11, 25, 33, 36, 41, and 53).

[56] See e-mail dated November 21, 2000 from Melanie Darke, Dept of Commerce, to Iryn Calilung, Office of Air Management.

Fund to be applied to off-site public infrastructure improvements needed to serve the site. $750,000 awarded to Whitley County, $115,923 received by Whitley County on March 16, 2000.

(c) Industrial Development Loan Assistance
A loan given to the Whitley County Redevelopment Commission to be used for the lease or purchase of real or personal property for the benefit of the project. $1 million awarded, the full $1 million approved May 10, 2000.

(d) Assistance from the Indiana Development Finance Authority
A loan to SDI for either capital or operating expenses associated with the project through the Business Development Loan Fund. $1.5 million awarded, the full $1.5 million received July 11, 2000. $1 million of the loan is forgivable if SDI invests $285 million in the project, creates 286 new full-time jobs at an average wage of $26.30/hr pre-benefits. SDI is currently making payments on the remaining $500,000.

Comment: Ohio was not provided a copy of the permit during the public notice period.

Response: There is no rule requiring IDEM to provide Ohio a copy of PSD construction permits. The State of Ohio did not provide comments the first time the PSD permit was proposed, published and issued. IDEM believes that not providing Ohio a copy of the revised draft permit will not affect the review process.

Comment: Commenters are concerned about NOx and SO2 emissions because they have the potential to produce acid rain, which affects the pH levels of soil. Farmers are concerned that they will have to increase limestone application to their fields in order to neutralize the soil. They want SDI to pay for the limestone and they want IDEM to consider this an “offset cost.” They also want to know how many tons of limestone it would take to neutralize 222 tons of SO2 gas per year and 515 tons of NOx per year.

Response: Responses to these comments are included in the July 7, 1999 TSD addendum of the PSD permit CP-183-10097 (Responses 21 and 23). Since there are many factors which play a role in the formation of acid rain, it is not possible to determine the amount of acid rain, if any, caused by a specific amount of emissions; therefore, it is impossible to determine the exact amount of limestone, if any, needed to neutralize the soil in response to a specific amount of SO2 and NOx emissions.

Comment: If ozone levels are too high will the plant cease production until levels leave the caution zone? Why not include the NOx from increased diesel usage in trains and trucks in addition to the 500 tons of NOx in the permit?

Response: Based on the air quality analysis conducted, IDEM has concluded that this proposed source will not contribute to an ozone violation. This is also supported by the fact that the proposed source will contribute less than one percent (1%) to the regional VOC inventory and one percent (1%) to the regional NOx inventory. Therefore, IDEM believes that requiring the plant to cease production during periods of high ozone would not achieve any measurable reduction in actual ozone levels.

The emissions from trucks and trains are not included in IDEM’s review because this permit only regulates stationary sources of emissions.

Comment: Why wasn't EPA at the public opinion meeting for the remanded issues if public opinion matters?

Response: IDEM is delegated to administer EPA's program; therefore, it is not necessary for EPA to attend IDEM's public hearings. However, EPA has been in very close communication with IDEM throughout this review process and is very concerned about issues raised by the public.

Comment: One commenter expressed concerns about ground water supply issues relating to the operation of the proposed facility.

Response: Lori F. Kaplan, Commissioner of IDEM, wrote a letter of response to the commenter.[57] The following response is taken from that letter and provided here for the benefit of other members of the public who may share the same concerns.

Domestic well owners are protected against the impacts of high capacity pumpage in accordance with Indiana Code 14-25-4, the Water Rights: Emergency Regulation statute. The Indiana Department of Natural Resources (DNR) helps address concerns about water rights and is aware of concerns that have been raised. DNR has done monitoring of water levels to obtain baseline data prior to the steel company going into operation. Residents with questions or an interest in having a water level documented may contact Mr. Mark Basch toll free at 877/928-3755.

Please note that the Indiana Department of Environmental Management (IDEM) does not have the regulatory authority to address water rights and that the concerns that have been raised about water usage are not being addressed by this agency.

Comment: COW commented that IDEM representatives should have made more of an effort to answer technical questions posed at the public hearing.

Response: Public hearings can sometimes last several hours; and therefore, in order to allow everyone who wishes to speak at the hearing an opportunity to do so, IDEM attempts to make responses to questions brief during the hearing. The purpose of the hearing is not to listen to IDEM representatives speak; it is to allow members of the public to speak and provide their comments on the proposed permit. In any case, IDEM representatives did make an effort to answer some questions at the hearing; however, many of the questions were very technical in nature and require more thought and consideration than is possible in the limited time available to provide responses during the actual public hearing. Additionally, IDEM cannot send to the public hearing all of the staff members who might be equipped to answer the various questions which might arise at the hearing. Frequently it is necessary to come back to the office and allow staff members to review the questions in more detail. This allows IDEM staff to spend the amount of time necessary to answer questions completely and accurately.

Comment: COW objects to IDEM's acceptance of SDI's claim of baghouse efficiency. They point to a stack test conducted on the SDI Butler facility, where particulate emissions were approximately 17 times the allowable level. The test report notes that the PM/PM10 problems were due to the fact that the LMF baghouse had just starting operating one week prior to the test; therefore, the filter caking that occurs in all baghouse filter bags

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[57] See October 25, 2000 letter from Lori F. Kaplan, Commissioner of IDEM.

did not have time to get to a thickness that would give maximum performance. COW states that IDEM needs to consider the variability of the control efficiency for the baghouse. COW asks the following questions:

(1) What is the design safety factor for control equipment that ensures that the applicant can achieve required emission limits?

(2) What is the range of filter efficiency for the proposed baghouse design?

(3) What does the filter efficiency drop off to when the bags are shaken during the cleaning process?

(4) By how many tons does IDEM allow an applicant, by design and intent, to exceed the federally enforceable emission limits?

COW concludes that since IDEM did not consider the variability of the baghouse filter efficiency, IDEM's calculations are incomplete.

Response: The particulate limit is based on the emission rate that has been achieved by other similar sources. There are no other similar sources required to meet a lower limit. It is the applicant's responsibility to install and operate a control device which can meet these stringent limitations. IDEM believes that it oversteps its authority of BACT when it begins to design the equipment for the company. However, SDI has stated that the vendor guarantee is for 0.0018 grains per dry standard cubic foot of exhaust air. The vendor guarantee is applicable at all times because the vendor understands that SDI is required to meet the limit at all times. Therefore, there is no range of efficiency; there is only a guaranteed outlet grain loading, which is applicable at all times during proper operation of the baghouse. IDEM requires continuous compliance with the emission limit, and does not intend to allow the applicant to exceed the limit.

Comment: COW states that confusion exists as to when the 15 day time period commences within which COW has to file a petition for administrative review with the Environmental Appeals Board. Since receipt of the document will not be on the same day as the issuance, it is requested that specific due dates of appeal be set forth and whether such dates require receipt of the petition or post mark of mailing of the petition.

Response: Indiana and federal laws dictate the requirements of appeals. The effective date of this permit and the time lines for appealing this permit decision are explained in the memorandum issued with the final permit. IDEM notes here for clarification that the memorandum issued with the final permit does not supplant the Indiana or federal law requirements concerning appeals, but rather, briefly explains those requirements.

ATTACHMENT A
Changes to Permit

Source Background and Description

Source Name:	Steel Dynamics, Inc.
Source Location:	2601 County Road 700 East, Columbia City, Indiana 46725
County:	Whitley
Construction Permit No.:	CP-183-10097-00030
Permit Modification No.:	183-12692-00030
SIC Code:	3312

All changes to permit conditions are shown below (additions are shown in bold and deletions are shown as strikeouts).

A.2 Emission Units and Pollution Control Equipment Summary

This permit is to construct and operate the following facilities:

(a) one (1) main single shell electric arc furnace (ID#s EAF 1a) and one (1) back-up single shell electric arc furnace (ID# EAF 1b). These furnaces are operated one at a time to produce molten steel at a maximum rate of 200 tons per hour. These furnaces utilize a direct shell evacuation control (DEC) system ("fourth hole" duct), an overhead roof exhaust system consisting of a **capture system consisting of a segmented** canopy hood, **scavenger duct, and cross-draft partitions,** and the following emission control technologies:

(1) DEC air gap for carbon monoxide (CO) and volatile organic compounds (VOC) emissions;

(2) low-NO_x/oxyfuel burners (combustion control) for nitrogen oxide (NO_x) emissions; and

(3) a baghouse (ID# 1) for particulate (PM and PM-10) emissions.

~~99.5~~ **99** percent of the emissions ~~from the operating EAF~~ **escaping the DEC system are collected by the overhead roof exhaust system and** exhaust through a stack (ID# 1)~~., and the rest exhaust through the melt shop roof monitor (ID# 3) as fugitive emissions~~; **There are no roof monitors in the meltshop.**

(b) one (1) ladle metallurgy refining station (LMS) (ID# 3a) that exhausts 99 percent of its emissions **are collected by the overhead roof exhaust system and** exhaust through the common EAF **baghouse** stack ~~and the rest through the melt shop roof monitor (ID# 3) as fugitive emissions;~~ **There are no roof monitors in the meltshop.**

(c) four (4) natural gas-fired ladle preheaters (ID# 3b through 3e), each with a maximum heat input rate of 10 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3)~~; **There are no roof monitors in the meltshop.**

(d) one (1) natural gas-fired ladle dryer (ID# 3f) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3)~~; **There are no roof monitors in the meltshop.**

(e) one (1) natural gas-fired tundish nozzle preheater (ID# 3g) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3)~~; **There are no roof monitors in the meltshop.**

(f) two (2) natural gas-fired tundish preheaters (ID#s 3h and 3i), each with a maximum heat input rate of 5 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3)~~; **There are no roof monitors in the meltshop.**

(g) one (1) natural gas-fired tundish dryer (ID# 3j) with a maximum heat input rate of 5 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3)~~; **There are no roof monitors in the meltshop.**

(h) one (1) continuous caster (ID# 3k) with a maximum casting rate of 200 tons of steel per hour, exhausting ~~98~~ **99** percent of its emissions **are collected by the overhead roof exhaust system and** exhaust through the common EAF **baghouse** stack ~~and the rest through the melt shop roof monitor (ID# 3) as fugitive emissions;~~ **There are no roof monitors in the meltshop.**

SECTION D.1 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) main single shell electric arc furnace (ID#s EAF 1a) and one (1) back-up single shell electric arc furnace (ID# EAF 1b). These furnaces are operated one at a time to produce molten steel at a maximum rate of 200 tons per hour. These furnaces utilize a direct shell evacuation control (DEC) system ("fourth hole" duct), an overhead roof exhaust system consisting of a **capture system consisting of a segmented** canopy hood, **scavenger duct, and cross-draft partitions,** and the following emission control technologies:

(1) DEC air gap for carbon monoxide (CO) and volatile organic compounds (VOC) emissions;

(2) low-NO_x/oxyfuel burners (combustion control) for nitrogen oxide (NO_x) emissions; and

(3) a baghouse (ID# 1) for particulate (PM and PM-10) emissions.

~~99.5~~ **99** percent of the emissions ~~from the operating EAF~~ **escaping the DEC system are collected by the overhead roof exhaust system and** exhaust through a stack (ID# 1)**.**~~, and the rest exhaust through the melt shop roof monitor (ID# 3) as fugitive emissions~~; **There are no roof monitors in the meltshop.**

Emissions Limitation and Standards

D.1.1 EAF Operation Limitation [326 IAC 2-1.1-5]

Pursuant to 326 IAC 2-1.1-5 (Air Quality Requirements), the Permittee shall only operate one electric arc furnace (EAF) at a time to produce molten steel at a maximum rate of 200 tons per hour.

D.1.2 Nitrogen Oxides (NO_x) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the EAF auxiliary burners shall be limited to low-NOx/oxyfuel burners and NO_x emissions from the EAF shall not exceed the following:

(a) NO_x emissions from the EAF shall not exceed 0.51 pounds per ton of steel produced and 102 pounds of NO_x per hour, based on a three (3) hour block average. The Permittee shall demonstrate compliance with ~~this~~ **these BACT** limit**s** within the time period specified in condition D.1.15, item (a)(1). ~~This~~ **These** BACT limit**s** shall be applicable only until compliance with 0.35 pounds per ton of steel produced and 70 pounds per hour BACT limits is demonstrated.

(b) NO_x emissions from the EAF shall not exceed 0.35 pounds per ton of steel produced and 70 pounds of NO_x per hour, based on a three (3) hour block average. The Permittee shall demonstrate compliance with this BACT limit within the time period specified in condition D.1.15, item (a)(2).

(c) If the Permittee applies for a permit modification to address the 70 pounds per hour limit, IDEM, OAM, shall issue a final decision on such application within 120 days upon IDEM's receipt of the application.

D.1.3 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the EAF except when otherwise specified in 40 CFR Part 60, Subpart AAa.

D.1.4 Particulate Matter (PM) [40 CFR Part 60, Subpart AAa]

Pursuant to 40 CFR Part 60, Subpart AAa (Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 7, 1983), filterable PM emissions from the EAF baghouse shall not exceed 0.0052 grains per dry standard cubic feet. (Attached is a copy of 40 CFR Part 60, Subpart AAa.)

D.1.5 Particulate Matter (PM) [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), filterable PM emissions from the EAF stack shall not exceed 58.5 pounds per hour when operating at the maximum process weight rate of 200 tons per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11}-40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of sixty thousand (60,000) pounds per hour.

D.1.6 Particulate Matter (PM/PM-10) - Best Available Control Technology [326 IAC 2-2-3]

(a) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), filterable PM/PM-10 emissions from the EAF shall be controlled by a baghouse. Filterable PM/PM-10 emissions from the EAF baghouse shall not exceed 0.0018 grains per dry standard cubic feet, as determined by the compliance test required in Condition D.1.15.

(b) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), total PM/PM-10 (including condensible PM-10) emissions from the EAF shall not exceed 0.0052 grains per dry standard cubic feet. The Department may revise this permit to adjust the total PM/PM-10 limitation based upon the results of the stack test required in Condition D.1.15. The Department will provide an opportunity for public notice and comment prior to finalizing any permit revision. IC 13-15-7-3 (Revocation or Modification of a Permit: Appeal to Board) shall apply to this permit condition.

(c) There shall be no roof monitors in the melt shop. The meltshop shall be located in a total enclosure subject to general ventilation that maintains the meltshop at a lower than ambient pressure to ensure in-draft through any doorway opening. Ventilation air from the total enclosure shall be conveyed to the meltshop baghouse.

(d) Cross-draft partitions shall be constructed surrounding the EAF in a manner that will promote good capture efficiency for the meltshop baghouse.

(e) A segmented canopy hood shall be constructed above the EAF. The canopy shall be divided into separate sections and the dampers operated in a manner that will maximize the draft directly above the point of greatest emissions.

D.1.7 Sulfur Dioxide (SO_2) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), SO_2 emissions from the EAF shall not exceed 50.0 pounds of SO_2 per hour, as determined by the compliance test required in condition D.1.15.

D.1.8 Carbon Monoxide (CO) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), CO emissions from the EAF shall be controlled by thermal oxidation and maintaining a negative pressure at the DEC air gap. CO emissions from the EAF shall not exceed 2.0 pounds per ton of steel produced and 400 pounds of CO per hour, based on a three (3) hour block average.

D.1.9 Carbon Monoxide (CO) [326 IAC 9-1]

Pursuant to 326 IAC 9-1 (Carbon Monoxide Emission Limits], the Permittee shall not allow the discharge of CO from the EAF unless the waste gas stream is controlled by a direct-flame afterburner, boiler, or other approved method. The Permittee has elected thermal oxidation at the DEC air gap.

D.1.10 Volatile Organic Compounds (VOC) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), VOC emissions from the EAF shall be minimized in accordance with the attached Scrap Management Program (Attachment B) and shall be controlled by thermal oxidation and maintaining a negative pressure at the DEC air gap. VOC emissions from the EAF shall not exceed 18 pounds of VOC per hour, based on a three (3) hour block average.

D.1.11 **Lead and** Hazardous Air Pollutant (HAP) Limitations [326 IAC 2-1.1-4] [326 IAC 2-2] [326 IAC 2-4.1-1]

Subject to Condition ~~C.18~~ **C.17** of this permit, the Permittee shall not allow:

(a) ~~stack and fugitive~~ lead to be emitted from the **meltshop baghouse controlling the** meltshop operations (EAF, LMS, and CC) in a quantity equal to or greater than ~~0.134~~ **0.114** pounds per hour.

(b) lead content of the EAF baghouse dust to exceed five-tenths percent (0.5%) by weight.

~~(b)~~**(c)** mercury to be emitted from the EAF stack in a quantity equal to or greater than 0.02 pounds per hour. This limitation is not federally enforceable.

~~(c)~~**(d)** beryllium to be emitted from the EAF stack in a quantity equal to or greater than 5.75×10^{-5} pounds per hour. This limitation is not federally enforceable.

~~(d)~~**(e)** fluorides to be emitted from the EAF stack in a quantity equal to or greater than 0.68 pound per hour.

~~(e)~~**(f)** manganese compounds to be emitted from the EAF stack in a quantity equal to or greater than 1.14 pounds per hour.

Compliance with these limitations will assure that the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) do not apply for lead, fluoride, mercury and beryllium and that the requirements of 326 IAC 2-4.1-1 (New Source Toxics Control) do not apply to the source.

D.1.12 Visible Emission Limitations - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements):

(a) Visible emissions from the EAF baghouse stack (ID #1) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9).

(b) All fugitive particulate matter (PM and PM-10,) emissions generated during furnace operations shall be captured by the melt shop roof canopy and ducted to the EAF baghouse (ID# 1) such that visible emissions generated at the EAF shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9) when emitted from any ~~roof monitor or~~ building opening.

~~(c) Visible emissions from the meltshop operations (EAF, LMS, and CC) roof monitor shall not three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9).~~

~~(d)~~**(c)** Additional inspections and preventive measures shall be performed as prescribed in the Preventive Maintenance Plan.

Compliance with the above opacity limitations shall also satisfy the requirements of 326 IAC 5-1-2 (Visible Emissions Limitations) under condition C.2 - Opacity Limitations.

D.1.13 Visible Emission Limitations [40 CFR Part 60, Subpart AAa]

Pursuant to 40 CFR 20.272a(a), the Permittee shall not cause to discharge into the atmosphere from the EAF any gases that:

(a) Exit from a control device and exhibit three percent (3%) opacity or greater; and

(b) Exit from the melt shop, and due solely to the operations of the EAF, exhibit six percent (6%) opacity or greater.

Compliance with the above opacity limitations shall also satisfy the requirements of 326 IAC 5-1-2 (Visible Emissions Limitations) under condition C.2 - Opacity Limitations.

D.1.14 Preventive Maintenance Plan [326 IAC 1-6-3]

A Preventive Maintenance Plan, in accordance with condition B.8 - Preventive Maintenance Plan of this permit, is required for the ~~EAF~~ **meltshop** and associated control devices.

Compliance Determination Requirements

D.1.15 Testing Requirements [326 IAC 2-1.1-11] [40 CFR 60.275a]

(a) (1) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for NO_x on the EAF within 60 days after achieving maximum capacity, but no later than 365 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.2, item (a).

(2) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for NO_x on the EAF within 540 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.2, item (b), and shall be repeated at least once every year from

the date of the valid compliance demonstration, until the Title V permit of this source is in effect.

(b) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for SO_2 on the EAF within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.7, respectively, and shall be repeated at least once every year from the date of the valid compliance demonstration, until the Title V permit of this source is in effect.

With the submission of the test protocol as required under condition C.7 of this permit, at a minimum, the Permittee shall include the information of sulfur content of the raw materials to be used in testing in comparison to the raw materials used for the past year.

(c) Pursuant to 326 IAC 2-1.1-11 and 40 CFR 60.275a, the Permittee shall test for filterable and condensible PM/PM-10 on the EAF within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing 40 CFR Part 60, Appendix A, Method 5, Method 201 or 201A, Method 202 or other methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.4, D.1.5, and D.1.6 and shall be repeated at least once every five (5) years from the date of the valid compliance demonstration.

(d) Pursuant to 326 IAC 2-1.1-11, the Permittee shall perform speciation tests from the EAF stack for emissions of HAPs listed under Section 112 (b) of the CAA within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing methods as approved by the Commissioner. These tests shall be performed to gather information on HAP emissions from the EAF stack and to demonstrate compliance with condition D.1.11 of this permit. The information shall include, as a minimum, results for hexane, toluene, benzene, formaldehyde, fluorides, naphthalene, arsenic compounds, beryllium compounds, cadmium compounds, chromium compounds, lead compounds, manganese compounds, mercury compounds, nickel compounds, and selenium compounds. The Permittee shall stack test for lead utilizing Method 12 **and a method detection level which is below the emission limit. This stack test for lead emissions shall be performed annually until the Title V permit of this source is in effect.**

Test results below the detection level indicate compliance with condition D.1.11 of this permit.

(e) Pursuant to 326 IAC 2-1.1-11 and 40 CFR 60.275a, the Permittee shall perform an initial compliance test for opacity on the EAF baghouse stack (ID# 1) ~~and melt shop roof monitor~~ within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing 40 CFR Part 60, Appendix A, Method 9, or other methods as approved by the Commissioner. This test shall be performed to determine compliance with condition D.1.12 and D.1.13.

(f) The baghouse EAF dust shall be sampled and analyzed for lead content on a monthly basis according to the procedures specified in the EPA publication SW-846-6010B, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*.

D.1.16 Continuous Emission Rate Monitoring Requirement [326 IAC 2-1.1-11] [326 IAC 3-5]

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 3-5-1(d), the Permittee shall install, calibrate, certify, operate, and maintain a continuous monitoring system for measuring CO and VOC emissions rates in pounds per hour from the EAF stack (ID# 1) in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3.

(b) The Permittee shall submit to IDEM, OAM, within ninety (90) days after monitor installation, a complete written continuous monitoring standard operating procedure (SOP), in accordance with the requirements of 326 IAC 3-5-4.

(c) The Permittee shall record the output of the system and shall perform the required record keeping, pursuant to 326 IAC 3-5-6, and reporting, pursuant to 326 IAC 3-5-7.

D.1.17 ~~Daily~~ Visible Emission Observations and Continuous Opacity Monitoring [326 IAC 2-1.1-11] [326 IAC 3-5] [40 CFR 60.273a]

(a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 3-5, and 40 CFR 60.273a, the Permittee shall do the following to demonstrate compliance with conditions D.1.12(a) and D.1.13(a):

(1) The Permittee shall install, calibrate, certify, operate, and maintain a continuous monitoring system to measure opacity from the EAF stack (ID# 1) in accordance with 326 IAC 3-5-2 and 3-5-3;

(2) The Permittee shall submit to IDEM, OAM, within (90) days after monitor installation, a written continuous monitoring standard operating procedure (SOP), in accordance with the requirements of 326 IAC 3-5-4.

(b) ~~Pursuant to 326 IAC 2-1.1-11, 326 IAC 3-5, and 40 CFR 60.273a, the Permittee shall demonstrate compliance with conditions D.1.12(b) and D.1.13(b) by having a certified visible emissions reader conduct and record observations of the melt shop roof monitor once per day when the EAF is operating in the melting and refining period, in accordance with 40 CFR 60, Appendix A, Method 9.~~

~~(c)~~ If the continuous opacity monitor is down for more than one (1) hour, the Permittee shall perform visible emission observation**s** once per hour by having a trained employee record whether emissions are normal or abnormal.

(1) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(2) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

Compliance Monitoring Requirements

D.1.18 Baghouse Operating Condition [326 IAC 2-1.1-11]

The baghouse (ID# 1) shall be operated at all times when the EAF is in operation.

(a) The Permittee shall record the pressure drop across the baghouse at least once per shift when the EAF is in operation.

(b) Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 4 - 10 inches of water to monitor compliance with the particulate emission limits in operation conditions D.1.4, D.1.5, and D.1.6.

(c) The Preventive Maintenance Plan for the baghouse shall contain troubleshooting contingency and response steps for when the pressure drop reading is outside of the above mentioned range for any one reading.

(d) The instruments used for determining the pressure shall comply with condition C.9 - Pressure Gauge Specifications of this permit and shall be calibrated at least once every six (6) months.

D.1.19 Baghouse Inspections [326 IAC 2-1.1-11]

An inspection shall be performed annually of all bags controlling the EAF. All defective bags shall be replaced. A record shall be kept of the results of the inspection and the number of bags replaced.

D.1.20 Broken or Failed Bag Detection [326 IAC 2-1.1-11]

(a) The Permittee shall install and operate a continuous bag leak detection system. The bag leak detection system shall meet the following requirements:

(1) The bag leak detection system must be certified by the manufacturer to be capable of detecting particulate matter emissions at concentrations of 0.0018 grains per actual cubic foot or less.

(2) The bag leak detection system sensor must provide output of relative particulate matter loadings.

(3) The bag leak detection system must be equipped with an alarm system that will alarm when an increase in relative particulate loadings is detected over a preset level.

(4) The bag leak detection system shall be installed and operated in a manner consistent with available written guidance from the U.S. Environmental Protection Agency or, in the absence of such written guidance, the manufacturer's written specifications and recommendations for installation, operation, and adjustment of the system.

(5) The initial adjustment of the system shall, at a minimum, consist of establishing the baseline output by adjusting the sensitivity (range) and the averaging period of the device, and establishing the alarm set points and the alarm delay time.

(6) In no event shall the sensitivity be increased by more than 100 percent or decreased by more than 50 percent over a 365 day period unless such adjustment follows a complete baghouse inspection which demonstrates the baghouse is in good operating condition.

(7) The bag detector must be installed downstream of the baghouse.

(b) In the event ~~that~~ **of a** bag **leak detection system alarm** ~~failure has been observed~~, the affected compartments will be shut down immediately until the failed units have been repaired or replaced. Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Preventive Maintenance Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Preventive Maintenance Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion. The Permittee shall keep a minimum of 100 bags on site to assure timely response to bag failures.

D.1.21 Monitoring of Operations [40 CFR 60.274a]

Pursuant to 40 CFR 60.274a, the Permittee shall comply with the following monitoring requirements:

(a) Except as provided under item (c) of this condition, the Permittee shall check and record on a once-per-shift basis the furnace static pressure and either:

(1) check and record the control system fan motor amperes and damper positions on a once-per-shift basis; or

(2) install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate through each separately ducted hood; or

(3) install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate at the control device inlet and records damper positions on a once-per-shift basis.

The monitoring device(s) may be installed in any appropriate location in the exhaust duct such that reproducible flow rate monitoring will result. The flow rate monitoring device(s) shall have an accuracy of ± 10 percent over its normal operating range and shall be calibrated according to the manufacturer's instructions. The IDEM, OAM, or the U.S. EPA may require the Permittee to demonstrate the accuracy of the monitoring device(s) relative to Methods 1 and 2 of 40 CFR Part 60, Appendix A.

(b) When the Permittee is required to demonstrate compliance with the standard in condition D.1.13(b) and at any other time IDEM, OAM, or the U.S. EPA may require, that either the control system fan motor amperes and all damper positions or the volumetric flow rate through each separately ducted hood shall be determined during all periods in which a hood is operated for the purpose of capturing emissions from the EAF.

(c) The Permittee shall perform monthly operational status inspections of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion). Any deficiencies shall be noted and proper maintenance performed.

(d) The Permittee shall install, calibrate, and maintain a monitoring device that allows the pressure in the free space inside the EAF to be monitored. The monitoring device may be installed in any appropriate location in the EAF or DEC duct prior to the introduction of ambient air such that reproducible results will be obtained. The pressure monitoring device shall have an accuracy of ± 5 millimeter of water gauge over its normal operating

range and shall be calibrated according to the manufacturer's instructions.

(e) The pressure in the free space inside the EAF shall be determined during the melting and refining period(s) using the monitoring device required under item (d) of this condition. The pressure determined during the most recent demonstration of compliance shall be maintained at all times when the EAF is operating in a meltdown and refining period.

D.1.22 DRI, Charge and Injection Carbon Sampling and Analysis [326 IAC 2-1.1-11]

(a) The sulfur content of the direct iron (DRI), charge carbon, and injection carbon added into the EAF shall not exceed the following in order to monitor compliance with condition D.1.7:

Raw Material	Sulfur Content (%)
direct reduced iron (DRI)	0.20
charge carbon	0.6
injection carbon	2.5

(b) The Permittee shall obtain vendor certifications and/or analyses to verify that shipments of raw materials do not exceed the thresholds stated in section (a).

D.1.23 Transformer Power Usage Monitoring [326 IAC 2-1.1-11]

Pursuant to 326 IAC 2-1.1-11, the Permittee shall monitor the transformer power usage at both EAFs in order to document compliance with Condition D.1.1.

D.1.24 Monitoring for Total Building Enclosure [326 IAC 2-1.1-11]

Within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, the Permittee shall demonstrate compliance with the requirement to provide total enclosure of the meltshop, Condition D.1.6(c) using the procedures listed in either (1) or (2) below. This compliance demonstration shall be repeated at the time of each Method 12 stack test for lead emissions from the meltshop baghouse stack. The results of this compliance demonstration shall be submitted to IDEM with the test results of each Method 12 stack test for lead emissions from the meltshop baghouse.

(1)(A) The Permittee shall use a propeller anemometer or equivalent device meeting the requirements specified in (i) through (iii) below:

(i) The propeller of the anemometer shall be made of a material of uniform density and shall be properly balanced to optimize performance.

(ii) The measurement range of the anemometer shall extend to at least 300 meters per minute (1,000 feet per minute).

(iii) A known relationship shall exist between the anemometer signal output and air velocity, and the anemometer must be equipped with a suitable readout system.

(B) Doorway in-draft shall be determined by placing the anemometer in the plane of the doorway opening near its center.

(C) Doorway in-draft shall be demonstrated for each doorway that is open during normal operation with all remaining doorways in the position that they are in during normal operation.

The Preventive Maintenance Plan for the meltshop shall contain troubleshooting contingency and response steps for when doorway in-draft is not demonstrated for any doorway that is open during normal operation.

(2)(A) The Permittee shall install a differential pressure gage on the leeward wall of the building to measure the pressure difference between the inside and outside of the building.

(B) The pressure gage shall be certified by the manufacturer to be capable of measuring pressure differential in the range of 0.02 to 0.2 mm Hg.

(C) Both the inside and outside taps shall be shielded to reduce the effects of wind.

(D) The Permittee shall demonstrate the inside of the building is maintained at a negative pressure as compared to the outside of the building of no less than 0.02 mm Hg when all doors are in the position they are in during normal operation.

The Preventive Maintenance Plan for the meltshop shall contain troubleshooting contingency and response steps for when the pressure differential between the inside and outside of the building is less than 0.02 mm Hg.

Record Keeping and Reporting Requirements

D.1.2~~4~~**5**Record Keeping Requirements [326 IAC 2-1.1-11] [40 CFR 60.276a]

(a) To document compliance with operation condition D.1.16, the Permittee shall maintain records required under 326 IAC 3-5-6 at the source in a manner so that they may be inspected by the IDEM, OAM, or the U.S. EPA., if so requested or required.

(b) To document compliance with operation condition D.1.17, the Permittee shall maintain records:

(1) required under 326 IAC 3-5-6 at the source in a manner so that they may be inspected by the IDEM, OAM, or the U.S. EPA., if so requested or required.

(2) of visible emission readings at the ~~melt shop roof monitor and~~ EAF stack and make available upon request to IDEM, OAM, and the U.S. EPA.

(c) To document compliance with operation condition D.1.18, the Permittee shall maintain the following:

(1) ~~Daily records~~ **Records** of the following baghouse operational parameters **once per shift** during normal operation:

(A) Differential pressure; and

(B) Cleaning cycle~~: frequency and differential pressure~~ **operation.**

(2) Documentation of all response steps implemented for every pressure drop

reading that is outside of the range.

(d) To document compliance with Condition D.1.15(f), The Permittee shall maintain monthly records of the results of the lead analyses of the baghouse EAF dust. The lead content of the baghouse EAF dust shall be recorded as a percent by weight.

~~(d)~~**(e)** Pursuant to 40 CFR 60.276a, records of the measurements required in 40 CFR 60.274a, as also required in condition D.1.21, must be retained for at least 5 years following the date of the measurement.

~~(e)~~**(f)** To document compliance with operation condition D.1.22, the Permittee shall maintain records of the verification of sulfur content of DRI, charge carbon, and injection carbon added into the EAF.

~~(f)~~**(g)** To document compliance with operation condition D.1.23, the Permittee shall maintain records of the transformer power usage of both EAF**s** ~~sufficiently~~ **sufficient** to document that only one EAF has operated at any given time.

(h) To document compliance with operation condition D.1.20, the Permittee shall maintain records of the dates and times of all bag leak detection system alarms, the cause of each alarm, and an explanation of all corrective actions taken.

~~(g)~~**(i)** All records shall be maintained in accordance with condition C.14 - General Record Keeping Requirements of this permit.

D.1.2~~5~~**6** Reporting Requirements [326 IAC 2-1.1-11] [40 CFR 60.276a]

(a) The Permittee shall submit a quarterly excess emissions report, if applicable, based on the continuous emissions monitor (CEM) data for CO and VOC, and continuous opacity monitor (COM) data, pursuant to 326 IAC 3-5-7. These reports shall be submitted within thirty (30) calendar days following the end of each calendar quarter and in accordance with condition C.15 - General Reporting Requirements of this permit.

(b) Pursuant to 40 CFR 60.276a, the Permittee shall comply with the following reporting requirements:

(1) The Permittee shall submit a semi-annual written report of exceedances of the control device opacity to IDEM, OAM, and the U.S. EPA.

(2) The Permittee shall submit semi-annually any values that exceed furnace static pressure established under 40 CFR 60.274a(g) and values of control system fan motor amperes that exceed 15 percent of the value established under 40 CFR 60.274a(c) or values of flow rates lower than those established under 40 CFR 60.274a(c) to IDEM, OAM, and the U.S. EPA.

(3) The Permittee shall furnish to IDEM, OAM, and the U.S. EPA a written report of the results of the compliance emission test required to determine compliance with conditions D.1.4 and D.1.13. This report shall include the following information:

(A) Facility name and address;

(B) Plant representative;

(C) Make and model of process, control device, and continuous monitoring equipment;

(D) Flow diagram of process and emissions capture equipment including other equipment or process(es) ducted to the same control device;

(E) Rated (design) capacity of process equipment;

(F) The following operating conditions:

(i) List of charge and tap weights and materials;

(ii) Heat times and process log;

(iii) Control device operation log; and

(iv) Continuous monitor or Reference Method 9 data.

(G) Test dates and test times;

(H) Test company;

(I) Test company representative;

(J) Test observers from outside agency;

(K) Description of test methodology used, including any deviation from standard reference methods;

(L) Schematic of sampling location;

(M) Number of sampling points;

(N) Description of sampling equipment;

(O) Listing of sampling equipment calibrations and procedures;

(P) Field and Laboratory data sheets;

(Q) Description of sample recovery procedures;

(R) Sampling equipment leak check results;

(S) Description of quality assurance procedures;

(T) Description of analytical procedures;

(U) Notation of sample blank corrections; and

(V) Sample emission calculations.

SECTION D.2 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) ladle metallurgy refining station (LMS) (ID# 3a) that exhausts 99 percent of its emissions **are collected by the overhead roof exhaust system and** exhaust through the common EAF **baghouse** stack ~~and the rest through the melt shop roof monitor (ID# 3) as fugitive emissions;~~ **There are no roof monitors in the meltshop.**

SECTION D.3 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

(a) four (4) natural gas-fired ladle preheaters (ID# 3b through 3e), each with a maximum heat input rate of 10 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3);~~ **There are no roof monitors in the meltshop.**

(b) one (1) natural gas-fired ladle dryer (ID# 3f) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3);~~ **There are no roof monitors in the meltshop.**

(c) one (1) natural gas-fired tundish nozzle preheater (ID# 3g) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3);~~ **There are no roof monitors in the meltshop.**

(d) two (2) natural gas-fired tundish preheaters (ID#s 3h and 3i), each with a maximum heat input rate of 5 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3);~~ **There are no roof monitors in the meltshop.**

(e) one (1) natural gas-fired tundish dryer (ID# 3j) with a maximum heat input rate of 5 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust **inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse.** ~~through the melt shop roof monitor (ID# 3);~~ **There are no roof monitors in the meltshop.**

SECTION D.4 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) continuous caster (ID# 3k) with a maximum casting rate of 200 tons of steel per hour, exhausting ~~98~~ **99** percent of its emissions **are collected by the overhead roof exhaust system and** exhaust through the common EAF **baghouse** stack ~~and the rest through the melt shop roof monitor (ID# 3) as fugitive emissions;~~ **There are no roof monitors in the meltshop.**

Emissions Limitation and Standards

D.4.1 Particulate Matter (PM/PM10) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), at least ~~98~~ **99** percent of the filterable and condensible PM/PM-10 emissions from the continuous caster shall be captured by the ~~melt shop roof canopy~~ **overhead roof exhaust system,** then controlled by the common EAF baghouse, which limit is set forth at condition D.1.6.

The following changes have been made to Attachment B of the permit, which is the scrap management plan.

SECTION D.5 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) natural gas-fired reheat furnace (ID# 2) with a nominal heat input rate of 260 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion and process emissions exhaust through a stack (ID# 2).

Emissions Limitation and Standards

D.5.1 Nitrogen Oxides (NO_x) - Best Available Control Technology [326 IAC 2-2-3]

(a) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the reheat furnace shall be limited to the use of ultra low-NOx natural gas-fired burners such that NO_x emissions shall not exceed 0.11 pound per million British Thermal Units.

(b) The Permittee shall not allow more than 189.8 million cubic feet of natural gas to be combusted in the reheat furnace on a monthly basis averaged over a twelve (12) month period.

Record Keeping and Reporting Requirements

D.5.4 Record Keeping Requirements [326 IAC 2-1.1-11]

(a) To document compliance with operation condition D.5.1(b), the Permittee shall maintain records of the natural gas combusted in the reheat furnace each month.

(b) All records shall be maintained in accordance with condition C.14 - General Record Keeping Requirements of this permit.

The following changes have been made to Attachment B of the permit, which is the scrap management plan.

ATTACHMENT B

VOLATILE ORGANIC COMPOUNDS, HAZARDOUS MATERIALS, AND RADIATION SCRAP MANAGEMENT PROGRAM

4. LEAD

~~The presence of~~ **Any** babbit, solder, balancing weights, **batteries, pipe fittings, old electrical wire and connectors, cooling units, turnings, soldered tins,** or materials with excessive amounts of lead-based paint shall be removed or the load shall be rejected.

CONSTRUCTION PERMIT
PREVENTION OF SIGNIFICANT DETERIORATION (PSD)
OFFICE OF AIR MANAGEMENT

Steel Dynamics, Inc.
2601 County Road 700 East
Columbia City, Indiana 46725

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1.1, 326 IAC 2-2, 40 CFR 52.21, 40 CFR 52.780, and 40 CFR 124, with conditions listed on the attached pages.

Construction Permit No.: CP-183-10097-00030	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date: July 7, 1999
PSD Significant Modification 183-12692-00030 Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

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SECTION D.3 EMISSION UNIT OPERATION CONDITIONS

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Emission Limitations and Standards

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Compliance Determination Requirements

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SECTION D.4 EMISSION UNIT OPERATION CONDITIONS

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Compliance Determination Requirements

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SECTION D.8 EMISSION UNIT OPERATION CONDITIONS

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Emission Limitations and Standards

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Compliance Determination Requirements

D.8.2 Testing Requirements [326 IAC 2-1.1-11]

SECTION D.9 EMISSION UNIT OPERATION CONDITIONS

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Emission Limitations and Standards

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Compliance Determination Requirements

D.9.3 Testing Requirements [326 IAC 2-1.1-11]

Malfunction Report

SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Management (OAM). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information

The Permittee owns a steel beam mill.

Responsible Official:	Richard P. Teets, Jr.
Source Address:	2601 County Road 700 East, Columbia City, Indiana 46725
Mailing Address:	2601 County Road 700 East, Columbia City, Indiana 46725
SIC Code:	3312
County Location:	Whitley
County Status:	Attainment for all criteria pollutants
Source Status:	Major source, under PSD Program and Part 70 Program

A.2 Emission Units and Pollution Control Equipment Summary

This permit is to construct and operate the following facilities:

(a) one (1) main single shell electric arc furnace (ID#s EAF 1a) and one (1) back-up single shell electric arc furnace (ID# EAF 1b). These furnaces are operated one at a time to produce molten steel at a maximum rate of 200 tons per hour. These furnaces utilize a direct shell evacuation control (DEC) system ("fourth hole" duct), an overhead roof exhaust system consisting of a capture system consisting of a segmented canopy hood, scavenger duct, and cross-draft partitions, and the following emission control technologies:

(1) DEC air gap for carbon monoxide (CO) and volatile organic compounds (VOC) emissions;

(2) low-NO_x/oxyfuel burners (combustion control) for nitrogen oxide (NO_x) emissions; and

(3) a baghouse (ID# 1) for particulate (PM and PM-10) emissions.

99 percent of the emissions escaping the DEC system are collected by the overhead roof exhaust system and exhaust through a stack (ID# 1). There are no roof monitors in the meltshop.

(b) one (1) ladle metallurgy refining station (LMS) (ID# 3a) that exhausts 99 percent of its emissions are collected by the overhead roof exhaust system and exhaust through the common EAF baghouse stack. There are no roof monitors in the meltshop.

(c) four (4) natural gas-fired ladle preheaters (ID# 3b through 3e), each with a maximum heat input rate of 10 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(d) one (1) natural gas-fired ladle dryer (ID# 3f) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(e) one (1) natural gas-fired tundish nozzle preheater (ID# 3g) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(f) two (2) natural gas-fired tundish preheaters (ID#s 3h and 3i), each with a maximum heat input rate of 5 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(g) one (1) natural gas-fired tundish dryer (ID# 3j) with a maximum heat input rate of 5 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(h) one (1) continuous caster (ID# 3k) with a maximum casting rate of 200 tons of steel per hour, exhausting 99 percent of its emissions are collected by the overhead roof exhaust system and exhaust through the common EAF baghouse stack. There are no roof monitors in the meltshop.

(i) one (1) natural gas-fired reheat furnace (ID# 2) with a nominal heat input rate of 260 million British Thermal Units per hour and utilizing ultra low-NO_x combustion control technology. Combustion and process emissions exhaust through a stack (ID# 2).

(j) one (1) EAF dust storage silo (ID# 4) equipped with a bin vent filter for particulate control (PM/PM-10).

(k) eight (8) raw material storage silos (ID#s 5 through and 12), each equipped with a bin vent filter for particulate (PM/PM-10) control, and an associated raw material receiving station, with work practices used for particulate (PM/PM-10) control ;

(l) a slag handling and processing area (ID# 14) with a maximum rated capacity of 150 tons per hour. This processing area consists of slag pot dumping, deskulling, slag cooling, digging of slag pits by a front-end loader, loading of grizzly feeder by a front-end loader, crushing, screening, conveyor transfer points, loading of materials into piles, storage piles, load out of materials from piles, and vehicle movement around piles. This processing area utilizes the following equipment:

(1) one (1) grizzly/feeder (ID# F-1) with a maximum capacity of 150 tons per hour;

(2) one (1) conveyor (ID# C-1) with a maximum capacity of 150 tons per hour;

(3) one (1) conveyor (ID# C-2) with a maximum capacity of 135 tons per hour;

(4) one (1) single deck screen (ID# SDSC-1) with a maximum capacity of 135 tons per hour;

(5) one (1) primary crusher (ID# CR-1) with a maximum capacity of 15 tons per hour;

(6) one (1) by-pass conveyor (ID# BC-1) with a maximum capacity of 15 tons per hour;

(7) one (1) screen (ID# SC-1) with maximum capacity of 15 tons per hour;

(8) one (1) stacker (ID# ST-1) with a maximum capacity of 6 tons per hour;

(9) two (2) stackers (ID# ST-2 and ST-3), each with a maximum capacity of 3 tons per hour;

(10) one (1) conveyor (ID# C-3) with a maximum capacity of 135 tons per hour;

(11) four (4) stackers (ID#s ST-4 through ST-7), each with a maximum capacity of 33, 42, 30, and 24 tons per hour.

Particulate emissions from the slag processing area are controlled by water suppression and minimizing drop heights. Particulate emissions from the slag dumping area are controlled by a structure as defined in Section D.7 of this permit.

(m) transporting on paved roadways and parking lots, unpaved roadways, and unpaved areas around slag storage piles and steel scrap piles.

(n) one (1) cooling tower (ID# 13) with a maximum water flow of 15,000 gallons per minute; and

(o) three (3) locomotives, each with a maximum diesel consumption of 10 gallons per hour.

A.3 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because it is a major source, as defined in 326 IAC 2-7-1(22). This source shall submit its Part 70 application within 12 months after being subject to the Part 70 Rules.

SECTION B GENERAL CONSTRUCTION AND OPERATION CONDITIONS

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2-1.1 AND 40 CFR 52.780, WITH CONDITIONS LISTED BELOW.

Construction Conditions [326 IAC 2-5.1]

B.1 General Construction Conditions

(a) The data and information supplied with the application shall be the basis for this permit. Prior to any proposed change in construction which would result in an increase in potential to emit exceeding those specified in 326 IAC 2 requiring approval, the change must be approved by the Office of Air Management (OAM).

(b) This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

B.2 Effective Date of the Permit [40 CFR 124.15, 124.19, and 124.20]

Pursuant to 40 CFR 124.15, 124.19, and 124.20, the effective date of this permit shall be thirty (30) days after the service of notice of the decision, except as provided in 40 CFR 124. Three (3) days shall be added to the thirty (30) day period if service of notice is by mail.

B.3 Revocation of Permits [326 IAC 2-1.1-9(5)] [40 CFR 52.21(r)(2)]

Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits) and 40 CFR 52.21(r)(2), the approval to construct shall become invalid if construction is not commenced within eighteen (18) months after receipt of this approval, if construction is suspended for a period of eighteen (18) months or more, or if construction is not completed within a reasonable time.

B.4 Permit Review Rules [326 IAC 2-5.1]

Notwithstanding condition no. B.5, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2-5.1 (Construction of New Sources).

B.5 First Time Operation Permit [326 IAC 2-5.1-3]

(a) This document shall also become a first-time operation permit pursuant to 326 IAC 2-5.1-3 (Permits) when, prior to start of operation, the following requirements are met:

(1) The attached affidavit of construction shall be submitted to the Office of Air Management (OAM), Permit Administration & Development Section, verifying that the facilities were constructed as proposed in the application. The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.

(2) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.

(b) Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.

(c) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-7-19 (Fees).

B.6 NSPS Reporting Requirement

That pursuant to the New Source Performance Standards (NSPS), Part 60.270a through 60.276a, Subpart AAa, the source owner/operator is hereby advised of the requirement to report the following information for affected NSPS facilities at the appropriate times:

(a) Commencement of construction date (no later than 30 days after such date);

(b) Anticipated start-up date (not more than 60 days or less than 30 days prior to such date);

(c) Actual start-up date (within 15 days after such date); and

(d) Date of performance testing (at least 30 days prior to such date), when required by a condition elsewhere in this permit.

Reports are to be sent to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

Operation Conditions

B.7 General Operation Conditions

(a) The data and information supplied in the application shall be the basis of this permit. Prior to any change in the operation which would result in an increase in potential to emit exceeding those specified in 326 IAC 2 requiring approval, the change must be approved by the Office of Air Management (OAM).

(b) The Permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC13-17) and the rules promulgated thereunder.

B.8 Preventive Maintenance Plan [326 IAC 1-6-3]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMP) within the date of initial start-up, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions;

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If due to circumstances beyond its control, the PMP cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Management

100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) The Permittee shall implement the Preventive Maintenance Plans as necessary to ensure that failure to implement the plan does not cause or contribute to a violation of any limitation on emissions or potential to emit.

(c) PMP's shall be submitted to IDEM, OAM, upon request and shall be subject to review and approval by IDEM, OAM.

B.9 Transfer of Permit [326 IAC 2-5.5-6]

Pursuant to 326 IAC 2-5.5-6 (Transfer of Permits):

(a) In the event that ownership of the steel beam mill is changed, the Permittee shall notify the OAM, Permit Branch, in writing of the change in ownership, within thirty (30) days of the change.

(b) The written notification shall be sufficient to transfer the permit from the current owner to the new owner.

(c) The OAM shall reserve the right to issue a new permit.

B.10 Permit Revocation [326 IAC 2-1.1-9(1)]

Pursuant to 326 IAC 2-1.1-9(1)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

(a) Violation of any conditions of this permit.

(b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.

(c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.

(d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.

(e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2 (Permit Review Rules).

B.11 Availability of Permit [326 IAC 2-5.1-3]

Pursuant to 326 IAC 2-5.1-3, the Permittee shall maintain the applicable permit on the premises of the source and shall make this permit available for inspection by the IDEM, or other public official having jurisdiction.

SECTION C SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards

C.1 Major Source

Pursuant to 326 IAC 2-2 (Prevention of Significant Deterioration) and 326 IAC 2-7 (Part 70 Permit Program), this source is a major source.

C.2 Opacity Limitations [326 IAC 5-1-2]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, or otherwise limited by this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.3 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

C.4 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5] [326 IAC 2-2-3]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations) and 326 IAC 2-2-3, fugitive particulate matter shall be controlled according to attached Fugitive Dust Control Plan (Attachment A).

C.5 Operation of Equipment [326 IAC 2-1.1-5] [326 IAC 2-2-3]

Except as provided otherwise, all air pollution control equipment listed in section D of this permit and used to comply with an applicable requirement shall be operated at all times that the emission units vented to the control equipment are in operation. The air pollution controls, operating practices, and quality of the raw materials shall be consistently implemented so as to not reduce the effectiveness of air pollution controls as required in Section D regardless of the production rate of the facilities regulated by this permit. This includes, but is not limited to, the sulfur content of raw materials, the operation of the thermal oxidation and negative pressure at the DEC air gap, the oil content and other quality control parameters of the scrap management program, fan amperage consistent with furnace operating mode, and burner operation.

C.6 Stack Height [326 IAC 1-7]

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted.

Testing Requirements

C.7 Performance Testing [326 IAC 3-6] [326 IAC 2-1.1-11]

(a) All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures) and 326 IAC 2-1.1-11, except as provided elsewhere in this

permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by the IDEM, OAM.

A test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

(b) All test reports must be received by IDEM, OAM, within forty-five (45) days after the completion of the testing. An extension may be granted by the Commissioner, if the source submits to IDEM, OAM, a reasonable written explanation within forty (40) days after the completion of the testing.

Compliance Monitoring Requirements

C.8 Compliance Monitoring

Compliance with applicable requirements shall be documented as required by this permit. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment upon start-up. If due to circumstances beyond its control, this schedule cannot be met, the Permittee shall notify:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

in writing, no more than ninety (90) days after receipt of this permit, with full justification of the reasons for the inability to meet this date and a schedule which it expects to meet. If a denial of the request is not received before the monitoring is fully implemented, the schedule shall be deemed approved.

C.9 Pressure Gauge Specifications

Whenever a condition in this permit requires the measurement of pressure drop across any part of the unit or its control device, the gauge employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent (±2%) of full scale reading.

Corrective Actions and Response Steps

C.10 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2.1.1-11]

(a) When the results of a stack test performed in conformance with condition C.7 - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. The Permittee shall submit a description of these corrective actions to IDEM, OAM, within thirty (30) days of receipt of the test results. The Permittee also shall take appropriate action to minimize emissions from the affected facility while the corrective actions are being implemented.

(b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAM, that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAM, may extend the retesting deadline.

(c) IDEM, OAM, reserves the authority to take any actions allowed under the law to resolve noncompliant stack tests.

Record Keeping and Reporting Requirements

C.11 Emission Statement [326 IAC 2-6]

(a) The Permittee shall submit a certified, annual emission statement that must be received by July 1 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The annual emission statement shall meet the following requirements:

(1) Indicate actual emissions of criteria pollutants from the source, in compliance with 326 IAC 2-6 (Emission Reporting);

(2) Indicate actual emissions of other regulated pollutants from the source, for purposes of Part 70 assessment fee.

(b) The annual emission statement covers the twelve (12) consecutive month time period starting January 1 and ending December 31. The annual emission statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(c) The annual emission statement required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAM, on or before the date it is due.

C.12 Monitoring Data Availability [326 IAC 2-1.1-11]

(a) If for reasons beyond its control, the operator fails to make required observations, sampling, maintenance procedures, or record keeping, as required by section D Compliance Monitoring and Record Keeping Requirements, reasons for this must be recorded.

(b) At its discretion, the IDEM, OAM, may excuse such failures provided adequate justification is documented and such failures do not exceed five percent (5%) of the operating time in any quarter.

(c) Temporary, unscheduled unavailability of staff qualified to perform the required observations, sampling, maintenance procedures, or record keeping shall be considered a valid reason for failure to perform the requirements stated above.

C.13 Records and Notice of Malfunction [326 IAC 1-6-2]

That pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

(a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the IDEM, OAM, or appointed representative upon request.

(b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to IDEM, OAM. Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence. The attached Malfunction Report Form (2 pages) or its substantial equivalent can be used for notifications made via facsimile and can be used as a follow up for notifications made via telephone.

(c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).

(d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

C.14 General Record Keeping Requirements [326 IAC 2-1.1-11]

(a) Records of all required monitoring data and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years and available upon the request of an IDEM, OAM representative. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If an IDEM, OAM, representative makes a request for records to the Permittee, the Permittee shall furnish the records to IDEM, OAM, within a reasonable time.

(b) All record keeping requirements not already legally required shall be implemented upon start-up.

C.15 General Reporting Requirements [326 IAC 2-1.1-11]

(a) Reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(b) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAM, on or before the date it is due.

(c) Unless otherwise specified in this permit, any report shall be submitted within thirty (30) days of the end of the reporting period.

(d) The first report shall cover the period commencing on the date of operation of the source following the issuance of this permit and ending on the last day of the reporting period.

Ambient Air Monitoring

C.16 Post Construction Ambient Monitoring [326 IAC 2-2-4]

Within 180 days of the effective date of this permit, two (2) ambient monitoring sites shall be established at locations approved by IDEM, OAM.

(a) A downwind monitoring site near the maximum impact area (Annual Maximum Impact Area: UTM East 639300 and UTM North 4553700) shall measure PM-10 and the following meteorological parameters: wind speed, wind direction, and outdoor temperature. This site shall operate for at least twenty-four (24) months after the permitted facilities begin operation. After the 24-month period, the Permittee may petition IDEM, OAM, to cease the monitoring activities and the department shall grant such petition within 45 days after receipt of the petition if it is established that the PM-10 levels continue to comply with the NAAQS and that the plant has minimal impact on air quality.

(b) A monitoring site upwind from the maximum impact area shall measure PM-10. This site shall operate for at least twenty-four (24) months after the permitted facilities begin operation. After the 24-month period, the Permittee may petition IDEM, OAM, to cease the monitoring activities and the department shall grant such petition within 45 days after receipt of the petition if it is established that the PM-10 levels continue to comply with the NAAQS and that the plant has minimal impact on air quality.

(c) Upon resolution of *American Trucking Ass'n v. U.S. EPA,* No. 97-1440 (D.C. Circuit), and subsequent USEPA administrative proceedings relative to the National Ambient Air Quality Standard for ozone and PM, the Department may require, consistent with the applicable NAAQS, the Permittee to operate an ozone monitor and/or a PM monitor to assess the impacts of the facility on local air quality. The Department will provide an opportunity for public notice and comment prior to finalizing any permit revision. IC 13-15-7-3 (Revocation or Modification of a Permit: Appeal to Board) shall apply to this permit condition.

(d) The monitors shall meet the operating and maintenance criteria contained in the Indiana Department of Environmental Management, Office of Air Management, Quality Assurance Manual. Additionally, a monitoring/QA plan must be submitted and approved by IDEM, OAM, prior to commencement of the monitoring.

(e) Ambient data along with precision and accuracy data from the monitors shall be submitted on a quarterly basis in a format approved by the Commissioner within sixty (60) days after the end of the quarter being reported.

C.17 Source Wide Hazardous Air Pollutant (HAP) Limitations [326 IAC 2-4.1-1]

(a) The Permittee shall not allow any single HAP to be emitted from the source which exceeds ten (10) tons per year.

(b) Not withstanding Condition D.1.11, the Permittee shall not allow any combination of HAPs to be emitted from the source which exceeds twenty-five (25) tons per year.

Therefore, the requirements of 326 IAC 2-4.1-1 (New Source Toxics Control) shall not apply.

SECTION D.1 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) main single shell electric arc furnace (ID#s EAF 1a) and one (1) back-up single shell electric arc furnace (ID# EAF 1b). These furnaces are operated one at a time to produce molten steel at a maximum rate of 200 tons per hour. These furnaces utilize a direct shell evacuation control (DEC) system ("fourth hole" duct), an overhead roof exhaust system consisting of a capture system consisting of a segmented canopy hood, scavenger duct, and cross-draft partitions, and the following emission control technologies:

(1) DEC air gap for carbon monoxide (CO) and volatile organic compounds (VOC) emissions;

(2) low-NO_x/oxyfuel burners (combustion control) for nitrogen oxide (NO_x) emissions; and

(3) a baghouse (ID# 1) for particulate (PM and PM-10) emissions.

99 percent of the emissions escaping the DEC system are collected by the overhead roof exhaust system and exhaust through a stack (ID# 1). There are no roof monitors in the meltshop.

Emissions Limitation and Standards

D.1.1 EAF Operation Limitation [326 IAC 2-1.1-5]

Pursuant to 326 IAC 2-1.1-5 (Air Quality Requirements), the Permittee shall only operate one electric arc furnace (EAF) at a time to produce molten steel at a maximum rate of 200 tons per hour.

D.1.2 Nitrogen Oxides (NO_x) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the EAF auxiliary burners shall be limited to low-NOx/oxyfuel burners and NO_x emissions from the EAF shall not exceed the following:

(a) NO_x emissions from the EAF shall not exceed 0.51 pounds per ton of steel produced and 102 pounds of NO_x per hour, based on a three (3) hour block average. The Permittee shall demonstrate compliance with these BACT limits within the time period specified in condition D.1.15, item (a)(1). These BACT limits shall be applicable only until compliance with 0.35 pounds per ton of steel produced and 70 pounds per hour BACT limits is demonstrated.

(b) NO_x emissions from the EAF shall not exceed 0.35 pounds per ton of steel produced and 70 pounds of NO_x per hour, based on a three (3) hour block average. The Permittee shall demonstrate compliance with this BACT limit within the time period specified in condition D.1.15, item (a)(2).

(c) If the Permittee applies for a permit modification to address the 70 pounds per hour limit, IDEM, OAM, shall issue a final decision on such application within 120 days upon IDEM's receipt of the application.

D.1.3 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the EAF except when otherwise specified in 40 CFR Part 60, Subpart AAa.

D.1.4 Particulate Matter (PM) [40 CFR Part 60, Subpart AAa]

Pursuant to 40 CFR Part 60, Subpart AAa (Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 7, 1983), filterable PM emissions from the EAF baghouse shall not exceed 0.0052 grains per dry standard cubic feet. (Attached is a copy of 40 CFR Part 60, Subpart AAa.)

D.1.5 Particulate Matter (PM) [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), filterable PM emissions from the EAF stack shall not exceed 58.5 pounds per hour when operating at the maximum process weight rate of 200 tons per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11}-40$ where E = rate of emission in pounds per hour; and P = process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of sixty thousand (60,000) pounds per hour.

D.1.6 Particulate Matter (PM/PM-10) - Best Available Control Technology [326 IAC 2-2-3]

(a) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), filterable PM/PM-10 emissions from the EAF shall be controlled by a baghouse. Filterable PM/PM-10 emissions from the EAF baghouse shall not exceed 0.0018 grains per dry standard cubic feet, as determined by the compliance test required in Condition D.1.15.

(b) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), total PM/PM-10 (including condensible PM-10) emissions from the EAF shall not exceed 0.0052 grains per dry standard cubic feet. The Department may revise this permit to adjust the total PM/PM-10 limitation based upon the results of the stack test required in Condition D.1.15. The Department will provide an opportunity for public notice and comment prior to finalizing any permit revision. IC 13-15-7-3 (Revocation or Modification of a Permit: Appeal to Board) shall apply to this permit condition.

(c) There shall be no roof monitors in the melt shop. The meltshop shall be located in a total enclosure subject to general ventilation that maintains the meltshop at a lower than ambient pressure to ensure in-draft through any doorway opening. Ventilation air from the total enclosure shall be conveyed to the meltshop baghouse.

(d) Cross-draft partitions shall be constructed surrounding the EAF in a manner that will promote good capture efficiency for the meltshop baghouse.

(e) A segmented canopy hood shall be constructed above the EAF. The canopy shall be divided into separate sections and the dampers operated in a manner that will maximize the draft directly above the point of greatest emissions.

D.1.7 Sulfur Dioxide (SO_2) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), SO_2 emissions from the EAF shall not exceed 50.0 pounds of SO_2 per hour, as determined by the compliance test required in condition D.1.15.

D.1.8 Carbon Monoxide (CO) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), CO emissions from the EAF shall be controlled by thermal oxidation and maintaining a negative pressure at the DEC air gap. CO emissions from the EAF shall not exceed 2.0 pounds per ton of steel produced and 400 pounds of CO per hour, based on a three (3) hour block average.

D.1.9 Carbon Monoxide (CO) [326 IAC 9-1]

Pursuant to 326 IAC 9-1 (Carbon Monoxide Emission Limits], the Permittee shall not allow the discharge of CO from the EAF unless the waste gas stream is controlled by a direct-flame afterburner, boiler, or other approved method. The Permittee has elected thermal oxidation at the DEC air gap.

D.1.10 Volatile Organic Compounds (VOC) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), VOC emissions from the EAF shall be minimized in accordance with the attached Scrap Management Program (Attachment B) and shall be controlled by thermal oxidation and maintaining a negative pressure at the DEC air gap. VOC emissions from the EAF shall not exceed 18 pounds of VOC per hour, based on a three (3) hour block average.

D.1.11 Lead and Hazardous Air Pollutant (HAP) Limitations [326 IAC 2-1.1-4] [326 IAC 2-2] [326 IAC 2-4.1-1]

Subject to Condition C.17 of this permit, the Permittee shall not allow:

(a) lead to be emitted from the meltshop baghouse controlling the meltshop operations (EAF, LMS, and CC) in a quantity equal to or greater than 0.114 pounds per hour.

(b) lead content of the EAF baghouse dust to exceed five-tenths percent (0.5%) by weight.

(c) mercury to be emitted from the EAF stack in a quantity equal to or greater than 0.02 pounds per hour. This limitation is not federally enforceable.

(d) beryllium to be emitted from the EAF stack in a quantity equal to or greater than 5.75×10^{-5} pounds per hour. This limitation is not federally enforceable.

(e) fluorides to be emitted from the EAF stack in a quantity equal to or greater than 0.68 pound per hour.

(f) manganese compounds to be emitted from the EAF stack in a quantity equal to or greater than 1.14 pounds per hour.

Compliance with these limitations will assure that the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) do not apply for lead, fluoride, mercury and beryllium and that the requirements of 326 IAC 2-4.1-1 (New Source Toxics Control) do not apply to the source.

D.1.12 Visible Emission Limitations - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements):

(a) Visible emissions from the EAF baghouse stack (ID #1) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9).

(b) All fugitive particulate matter (PM and PM-10,) emissions generated during furnace operations shall be captured by the melt shop roof canopy and ducted to the EAF baghouse (ID# 1) such that visible emissions generated at the EAF shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9) when emitted from any building opening.

(c) Additional inspections and preventive measures shall be performed as prescribed in the Preventive Maintenance Plan.

Compliance with the above opacity limitations shall also satisfy the requirements of 326 IAC 5-1-2 (Visible Emissions Limitations) under condition C.2 - Opacity Limitations.

D.1.13 Visible Emission Limitations [40 CFR Part 60, Subpart AAa]

Pursuant to 40 CFR 20.272a(a), the Permittee shall not cause to discharge into the atmosphere from the EAF any gases that:

(a) Exit from a control device and exhibit three percent (3%) opacity or greater; and

(b) Exit from the melt shop, and due solely to the operations of the EAF, exhibit six percent (6%) opacity or greater.

Compliance with the above opacity limitations shall also satisfy the requirements of 326 IAC 5-1-2 (Visible Emissions Limitations) under condition C.2 - Opacity Limitations.

D.1.14 Preventive Maintenance Plan [326 IAC 1-6-3]

A Preventive Maintenance Plan, in accordance with condition B.8 - Preventive Maintenance Plan of this permit, is required for the meltshop and associated control devices.

Compliance Determination Requirements

D.1.15 Testing Requirements [326 IAC 2-1.1-11] [40 CFR 60.275a]

(a) (1) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for NO_x on the EAF within 60 days after achieving maximum capacity, but no later than 365 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.2, item (a).

(2) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for NO_x on the EAF within 540 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.2, item (b), and shall be repeated at least once every year from the date of the valid compliance demonstration, until the Title V permit of this source is in effect.

(b) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for SO_2 on the EAF within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.7, respectively, and shall be repeated at least once every year from the date of the valid compliance demonstration, until the Title V permit of this source is in effect.

With the submission of the test protocol as required under condition C.7 of this permit, at a minimum, the Permittee shall include the information of sulfur content of the raw materials to be used in testing in comparison to the raw materials used for the past year.

(c) Pursuant to 326 IAC 2-1.1-11 and 40 CFR 60.275a, the Permittee shall test for filterable and condensible PM/PM-10 on the EAF within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing 40 CFR Part 60, Appendix A, Method 5, Method 201 or 201A, Method 202 or other methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.4, D.1.5, and D.1.6 and shall be repeated at least once every five (5) years from the date of the valid compliance demonstration.

(d) Pursuant to 326 IAC 2-1.1-11, the Permittee shall perform speciation tests from the EAF stack for emissions of HAPs listed under Section 112 (b) of the CAA within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing methods as approved by the Commissioner. These tests shall be performed to gather information on HAP emissions from the EAF stack and to demonstrate compliance with condition D.1.11 of this permit. The information shall include, as a minimum, results for hexane, toluene, benzene, formaldehyde, fluorides, naphthalene, arsenic compounds, beryllium compounds, cadmium compounds, chromium compounds, lead compounds, manganese compounds, mercury compounds, nickel compounds, and selenium compounds. The Permittee shall stack test for lead utilizing Method 12 and a method detection level which is below the emission limit. This stack test for lead emissions shall be performed annually until the Title V permit of this source is in effect.

Test results below the detection level indicate compliance with condition D.1.11 of this permit.

(e) Pursuant to 326 IAC 2-1.1-11 and 40 CFR 60.275a, the Permittee shall perform an initial compliance test for opacity on the EAF baghouse stack (ID# 1) within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing 40 CFR Part 60, Appendix A, Method 9, or other methods as approved by the Commissioner. This test shall be performed to determine compliance with condition D.1.12 and D.1.13.

(f) The baghouse EAF dust shall be sampled and analyzed for lead content on a monthly basis according to the procedures specified in the EPA publication SW-846-6010B, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*.

D.1.16 Continuous Emission Rate Monitoring Requirement [326 IAC 2-1.1-11] [326 IAC 3-5]

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 3-5-1(d), the Permittee shall install, calibrate, certify, operate, and maintain a continuous monitoring system for measuring CO and VOC emissions rates in pounds per hour from the EAF stack (ID# 1) in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3.

(b) The Permittee shall submit to IDEM, OAM, within ninety (90) days after monitor installation, a complete written continuous monitoring standard operating procedure (SOP), in accordance with the requirements of 326 IAC 3-5-4.

(c) The Permittee shall record the output of the system and shall perform the required record keeping, pursuant to 326 IAC 3-5-6, and reporting, pursuant to 326 IAC 3-5-7.

D.1.17 Visible Emission Observations and Continuous Opacity Monitoring [326 IAC 2-1.1-11] [326 IAC 3-5] [40 CFR 60.273a]

(a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 3-5, and 40 CFR 60.273a, the Permittee shall do the following to demonstrate compliance with conditions D.1.12(a) and D.1.13(a):

(1) The Permittee shall install, calibrate, certify, operate, and maintain a continuous monitoring system to measure opacity from the EAF stack (ID# 1) in accordance with 326 IAC 3-5-2 and 3-5-3;

(2) The Permittee shall submit to IDEM, OAM, within (90) days after monitor installation, a written continuous monitoring standard operating procedure (SOP), in accordance with the requirements of 326 IAC 3-5-4.

(b) If the continuous opacity monitor is down for more than one (1) hour, the Permittee shall perform visible emission observations once per hour by having a trained employee record whether emissions are normal or abnormal.

(1) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(2) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

Compliance Monitoring Requirements

D.1.18 Baghouse Operating Condition [326 IAC 2-1.1-11]

The baghouse (ID# 1) shall be operated at all times when the EAF is in operation.

(a) The Permittee shall record the pressure drop across the baghouse at least once per shift when the EAF is in operation.

(b) Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 4 - 10 inches of water to monitor compliance with the particulate emission limits in operation conditions D.1.4, D.1.5, and D.1.6.

(c) The Preventive Maintenance Plan for the baghouse shall contain troubleshooting contingency and response steps for when the pressure drop reading is outside of the above mentioned range for any one reading.

(d) The instruments used for determining the pressure shall comply with condition C.9 - Pressure Gauge Specifications of this permit and shall be calibrated at least once every six (6) months.

D.1.19 Baghouse Inspections [326 IAC 2-1.1-11]

An inspection shall be performed annually of all bags controlling the EAF. All defective bags shall be replaced. A record shall be kept of the results of the inspection and the number of bags replaced.

D.1.20 Broken or Failed Bag Detection [326 IAC 2-1.1-11]

(a) The Permittee shall install and operate a continuous bag leak detection system. The bag leak detection system shall meet the following requirements:

(a) The bag leak detection system must be certified by the manufacturer to be capable of detecting particulate matter emissions at concentrations of 0.0018 grains per actual cubic foot or less.

(b) The bag leak detection system sensor must provide output of relative particulate matter loadings.

(c) The bag leak detection system must be equipped with an alarm system that will alarm when an increase in relative particulate loadings is detected over a preset level.

(d) The bag leak detection system shall be installed and operated in a manner consistent with available written guidance from the U.S. Environmental Protection Agency or, in the absence of such written guidance, the manufacturer's written specifications and recommendations for installation, operation, and adjustment of the system.

(e) The initial adjustment of the system shall, at a minimum, consist of establishing the baseline output by adjusting the sensitivity (range) and the averaging period of the device, and establishing the alarm set points and the alarm delay time.

(f) In no event shall the sensitivity be increased by more than 100 percent or decreased by more than 50 percent over a 365 day period unless such adjustment follows a complete baghouse inspection which demonstrates the baghouse is in good operating condition.

(g) The bag detector must be installed downstream of the baghouse.

(b) In the event of a bag leak detection system alarm, the affected compartments will be shut down immediately until the failed units have been repaired or replaced. Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Preventive Maintenance Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Preventive Maintenance Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion. The Permittee shall keep a minimum of 100 bags on site to assure timely response to bag failures.

D.1.21 Monitoring of Operations [40 CFR 60.274a]

Pursuant to 40 CFR 60.274a, the Permittee shall comply with the following monitoring requirements:

(a) Except as provided under item (c) of this condition, the Permittee shall check and record on a once-per-shift basis the furnace static pressure and either:

(1) check and record the control system fan motor amperes and damper positions on a once-per-shift basis; or

(2) install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate through each separately ducted hood; or

(3) install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate at the control device inlet and records damper positions on a once-per-shift basis.

The monitoring device(s) may be installed in any appropriate location in the exhaust duct such that reproducible flow rate monitoring will result. The flow rate monitoring device(s) shall have an accuracy of ± 10 percent over its normal operating range and shall be calibrated according to the manufacturer's instructions. The IDEM, OAM, or the U.S. EPA may require the Permittee to demonstrate the accuracy of the monitoring device(s) relative to Methods 1 and 2 of 40 CFR Part 60, Appendix A.

(b) When the Permittee is required to demonstrate compliance with the standard in condition D.1.13(b) and at any other time IDEM, OAM, or the U.S. EPA may require, that either the control system fan motor amperes and all damper positions or the volumetric flow rate through each separately ducted hood shall be determined during all periods in which a hood is operated for the purpose of capturing emissions from the EAF.

(c) The Permittee shall perform monthly operational status inspections of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion). Any deficiencies shall be noted and proper maintenance performed.

(d) The Permittee shall install, calibrate, and maintain a monitoring device that allows the pressure in the free space inside the EAF to be monitored. The monitoring device may be installed in any appropriate location in the EAF or DEC duct prior to the introduction of ambient air such that reproducible results will be obtained. The pressure monitoring device shall have an accuracy of ± 5 millimeter of water gauge over its normal operating range and shall be calibrated according to the manufacturer's instructions.

(e) The pressure in the free space inside the EAF shall be determined during the melting and refining period(s) using the monitoring device required under item (d) of this condition. The pressure determined during the most recent demonstration of compliance shall be maintained at all times when the EAF is operating in a meltdown and refining period.

D.1.22 DRI, Charge and Injection Carbon Sampling and Analysis [326 IAC 2-1.1-11]

(a) The sulfur content of the direct iron (DRI), charge carbon, and injection carbon added into the EAF shall not exceed the following in order to monitor compliance with condition D.1.7:

Raw Material	Sulfur Content (%)
direct reduced iron (DRI)	0.20
charge carbon	0.6
injection carbon	2.5

(b) The Permittee shall obtain vendor certifications and/or analyses to verify that shipments of raw materials do not exceed the thresholds stated in section (a).

D.1.23 Transformer Power Usage Monitoring [326 IAC 2-1.1-11]

Pursuant to 326 IAC 2-1.1-11, the Permittee shall monitor the transformer power usage at both EAFs in order to document compliance with Condition D.1.1.

D.1.24 Monitoring for Total Building Enclosure [326 IAC 2-1.1-11]

Within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, the Permittee shall demonstrate compliance with the requirement to provide total enclosure of the meltshop, Condition D.1.6(c) using the procedures listed in either (1) or (2) below. This compliance demonstration shall be repeated at the time of each Method 12 stack test for lead emissions from the meltshop baghouse stack. The results of this compliance demonstration shall be submitted to IDEM with the test results of each Method 12 stack test for lead emissions from the meltshop baghouse.

(1)(A) The Permittee shall use a propeller anemometer or equivalent device meeting the requirements specified in (i) through (iii) below:

(a) The propeller of the anemometer shall be made of a material of uniform density and shall be properly balanced to optimize performance.

(b) The measurement range of the anemometer shall extend to at least 300 meters per minute (1,000 feet per minute).

(c) A known relationship shall exist between the anemometer signal output and air velocity, and the anemometer must be equipped with a suitable readout system.

(B) Doorway in-draft shall be determined by placing the anemometer in the plane of the doorway opening near its center.

(C) Doorway in-draft shall be demonstrated for each doorway that is open during normal operation with all remaining doorways in the position that they are in during normal operation.

The Preventive Maintenance Plan for the meltshop shall contain troubleshooting contingency and response steps for when doorway in-draft is not demonstrated for any doorway that is open during normal operation.

(2)(A) The Permittee shall install a differential pressure gage on the leeward wall of the building to measure the pressure difference between the inside and outside of the building.

(B) The pressure gage shall be certified by the manufacturer to be capable of measuring pressure differential in the range of 0.02 to 0.2 mm Hg.

(C) Both the inside and outside taps shall be shielded to reduce the effects of wind.

(D) The Permittee shall demonstrate the inside of the building is maintained at a negative pressure as compared to the outside of the building of no less than 0.02 mm Hg when all doors are in the position they are in during normal operation.

The Preventive Maintenance Plan for the meltshop shall contain troubleshooting contingency and response steps for when the pressure differential between the inside and outside of the building is less than 0.02 mm Hg.

Record Keeping and Reporting Requirements

D.1.25 Record Keeping Requirements [326 IAC 2-1.1-11] [40 CFR 60.276a]

(a) To document compliance with operation condition D.1.16, the Permittee shall maintain records required under 326 IAC 3-5-6 at the source in a manner so that they may be inspected by the IDEM, OAM, or the U.S. EPA., if so requested or required.

(b) To document compliance with operation condition D.1.17, the Permittee shall maintain records:

(1) required under 326 IAC 3-5-6 at the source in a manner so that they may be inspected by the IDEM, OAM, or the U.S. EPA., if so requested or required.

(2) of visible emission readings at the EAF stack and make available upon request to IDEM, OAM, and the U.S. EPA.

(c) To document compliance with operation condition D.1.18, the Permittee shall maintain the following:

(1) Records of the following baghouse operational parameters once per shift during normal operation:

(A) Differential pressure; and

(B) Cleaning cycle: operation.

(2) Documentation of all response steps implemented for every pressure drop reading that is outside of the range.

(d) To document compliance with Condition D.1.15(f), The Permittee shall maintain monthly records of the results of the lead analyses of the baghouse EAF dust. The lead content of the baghouse EAF dust shall be recorded as a percent by weight.

(e) Pursuant to 40 CFR 60.276a, records of the measurements required in 40 CFR 60.274a, as also required in condition D.1.21, must be retained for at least 5 years following the date of the measurement.

(f) To document compliance with operation condition D.1.22, the Permittee shall maintain records of the verification of sulfur content of DRI, charge carbon, and injection carbon added into the EAF.

(g) To document compliance with operation condition D.1.23, the Permittee shall maintain records of the transformer power usage of both EAFs sufficient to document that only one EAF has operated at any given time.

(h) To document compliance with operation condition D.1.20, the Permittee shall maintain records of the dates and times of all bag leak detection system alarms, the cause of each alarm, and an explanation of all corrective actions taken.

(i) All records shall be maintained in accordance with condition C.14 - General Record Keeping Requirements of this permit.

D.1.26 Reporting Requirements [326 IAC 2-1.1-11] [40 CFR 60.276a]

(a) The Permittee shall submit a quarterly excess emissions report, if applicable, based on the continuous emissions monitor (CEM) data for CO and VOC, and continuous opacity monitor (COM) data, pursuant to 326 IAC 3-5-7. These reports shall be submitted within thirty (30) calendar days following the end of each calendar quarter and in accordance with condition C.15 - General Reporting Requirements of this permit.

(b) Pursuant to 40 CFR 60.276a, the Permittee shall comply with the following reporting requirements:

(1) The Permittee shall submit a semi-annual written report of exceedances of the control device opacity to IDEM, OAM, and the U.S. EPA.

(2) The Permittee shall submit semi-annually any values that exceed furnace static pressure established under 40 CFR 60.274a(g) and values of control system fan motor amperes that exceed 15 percent of the value established under 40 CFR 60.274a(c) or values of flow rates lower than those established under 40 CFR 60.274a(c) to IDEM, OAM, and the U.S. EPA.

(3) The Permittee shall furnish to IDEM, OAM, and the U.S. EPA a written report of the results of the compliance emission test required to determine compliance with conditions D.1.4 and D.1.13. This report shall include the following information:

(A) Facility name and address;

(B) Plant representative;

(C) Make and model of process, control device, and continuous monitoring equipment;

(D) Flow diagram of process and emissions capture equipment including other equipment or process(es) ducted to the same control device;

(E) Rated (design) capacity of process equipment;

(F) The following operating conditions:

(i) List of charge and tap weights and materials;

(ii) Heat times and process log;

(iii) Control device operation log; and

(iv) Continuous monitor or Reference Method 9 data.

(G) Test dates and test times;

(H) Test company;

(I) Test company representative;

(J) Test observers from outside agency;

(K) Description of test methodology used, including any deviation from standard reference methods;

(L) Schematic of sampling location;

(M) Number of sampling points;

(N) Description of sampling equipment;

(O) Listing of sampling equipment calibrations and procedures;

(P) Field and Laboratory data sheets;

(Q) Description of sample recovery procedures;

(R) Sampling equipment leak check results;

(S) Description of quality assurance procedures;

(T) Description of analytical procedures;

(U) Notation of sample blank corrections; and

(V) Sample emission calculations.

SECTION D.2 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) ladle metallurgy refining station (LMS) (ID# 3a) that exhausts 99 percent of its emissions are collected by the overhead roof exhaust system and exhaust through the common EAF baghouse stack. There are no roof monitors in the meltshop.

Emissions Limitation and Standards

D.2.1 Particulate Matter (PM/PM-10) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), at least 99 percent of the filterable and condensible PM/PM-10 emissions from the LMS shall be captured by the melt shop roof canopy then controlled by the common EAF baghouse, which limit is set forth at condition D.1.6.

D.2.2 Particulate Matter (PM) [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), filterable PM emissions from the LMS shall not exceed 58.5 pounds per hour when operating at the maximum process weight rate of 200 tons per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11}-40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of sixty thousand (60,000) pounds per hour.

Compliance Determination, Compliance Monitoring, Record Keeping and Reporting Requirements

Refer to section D.1 of this permit for compliance determination, compliance monitoring, record keeping, and reporting requirements that may apply to the EAF baghouse.

SECTION D.3 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

(a) four (4) natural gas-fired ladle preheaters (ID# 3b through 3e), each with a maximum heat input rate of 10 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(b) one (1) natural gas-fired ladle dryer (ID# 3f) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(c) one (1) natural gas-fired tundish nozzle preheater (ID# 3g) with a maximum heat input rate of 10 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(d) two (2) natural gas-fired tundish preheaters (ID#s 3h and 3i), each with a maximum heat input rate of 5 million British Thermal Units per hour and each utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

(e) one (1) natural gas-fired tundish dryer (ID# 3j) with a maximum heat input rate of 5 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion emissions exhaust inside the building, and are collected by the overhead roof exhaust system and ducted to the meltshop baghouse. There are no roof monitors in the meltshop.

Emissions Limitation and Standards

D.3.1 Nitrogen Oxides (NO_x) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the above-mentioned facilities shall be limited to the use of low-NOx natural gas-fired burners such that NO_x emissions shall not exceed 0.10 pound per million British Thermal Units.

Compliance Determination Requirements

D.3.2 Testing Requirements [326 IAC 2-1.1-11]

Testing of the above-mentioned facilities is not required by this permit.

SECTION D.4 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) continuous caster (ID# 3k) with a maximum casting rate of 200 tons of steel per hour, exhausting 99 percent of its emissions are collected by the overhead roof exhaust system and exhaust through the common EAF baghouse stack. There are no roof monitors in the meltshop.

Emissions Limitation and Standards

D.4.1 Particulate Matter (PM/PM10) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), at least 99 percent of the filterable and condensible PM/PM-10 emissions from the continuous caster shall be captured by the overhead roof exhaust system, then controlled by the common EAF baghouse, which limit is set forth at condition D.1.6.

D.4.2 Particulate Matter (PM) [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), filterable PM emissions from the continuous caster shall not exceed 58.5 pounds per hour when operating at the maximum process weight rate of 200 tons per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11}-40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour.

The above equation is used for interpolation and extrapolation of the data for process weight rates in excess of sixty thousand (60,000) pounds per hour.

Compliance Determination, Compliance Monitoring, Record Keeping and Reporting Requirements

Refer to section D.1 of this permit for compliance determination, compliance monitoring, record keeping, and reporting requirements that may apply to the EAF baghouse.

SECTION D.5 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

one (1) natural gas-fired reheat furnace (ID# 2) with a nominal heat input rate of 260 million British Thermal Units per hour and utilizing low-NO_x combustion control technology. Combustion and process emissions exhaust through a stack (ID# 2).

Emissions Limitation and Standards

D.5.1 Nitrogen Oxides (NO_x) - Best Available Control Technology [326 IAC 2-2-3]

(a) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the reheat furnace shall be limited to the use of ultra low-NOx natural gas-fired burners such that NO_x emissions shall not exceed 0.11 pound per million British Thermal Units.

(b) The Permittee shall not allow more than 189.8 million cubic feet of natural gas to be combusted in the reheat furnace on a monthly basis averaged over a twelve (12) month period.

D.5.2 Carbon Monoxide (CO) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), CO emissions from the reheat furnace shall not exceed 0.03 pound per million British Thermal Units.

Compliance Determination Requirements

D.5.3 Testing Requirements [326 IAC 2-1.1-11]

Pursuant to 326 IAC 2-1.1-11, the Permittee shall perform NO_x and CO testing on the reheat furnace within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.5.1 and D.5.2, respectively, and shall be repeated at least once every five (5) years from the date of the valid compliance demonstration.

Record Keeping and Reporting Requirements

D.5.4 Record Keeping Requirements [326 IAC 2-1.1-11]

(a) To document compliance with operation condition D.5.1(b), the Permittee shall maintain records of the natural gas combusted in the reheat furnace each month.

(b) All records shall be maintained in accordance with condition C.14 - General Record Keeping Requirements of this permit.

SECTION D.6 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

(a) one (1) EAF dust storage silo (ID# 4) that is equipped with a bin vent filter for particulate control (PM/PM-10).

(b) eight (8) raw material storage silos (ID#s 5 through and 12), each equipped with a bin vent filter for particulate (PM/PM-10) control, and an associated raw material receiving station, with work practices used for particulate (PM/PM-10) control.

Emissions Limitation and Standards

D.6.1 Particulate Matter (PM/PM-10) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), filterable PM/ PM-10 emissions from each of the nine (9) storage silos shall not exceed 0.01 grains per dry standard cubic feet.

D.6.2 Visible Emission Limitation - Best Available Control Technology [326 IAC 2-2-3]

(a) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), visible emissions from each of the nine (9) storage silos shall not exceed three percent (3%) opacity.

(b) Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), visible emissions from the EAF dust handling system and the raw material receiving station shall not exceed three percent (3%) opacity or greater based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9).

D.6.3 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the EAF dust handling system except when otherwise specified in 40 CFR Part 60, Subpart AAa.

D.6.4 Visible Emission Limitations [40 CFR Part 60, Subpart AAa]

Pursuant to 40 CFR 60.272a(a), the Permittee shall not cause to discharge into the atmosphere from the EAF dust handling system any gases that exhibit ten percent (10%) opacity or greater.

D.6.5 Preventive Maintenance Plan [326 IAC 1-6-3]

A Preventive Maintenance Plan, in accordance with condition B.8 - Preventive Maintenance Plan, of this permit, is required for the nine (9) storage silos and associated control devices.

Compliance Determination Requirements

D.6.6 Testing Requirements [326 IAC 2-1.1-11]

Testing of the nine (9) storage silos is not required by this permit.

Compliance Monitoring Requirements

D.6.7 Visible Emissions Notations [326 IAC 2-1.1-11]

(a) Weekly visible emission notations of the nine (9) storage silos exhaust vents and the raw material receiving station shall be performed during normal daylight operations when loading or unloading material. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, when the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed.

D.6.8 Bin Vent Filter Inspections [326 IAC 2-1.1-11]

An inspection shall be performed each calender quarter of all bin vent filters controlling the nine (9) storage silos. All defective filters shall be replaced. A record shall be kept of the results of the inspection and the number of bags replaced.

D.6.9 Broken or Failed Bin Vent Filter Detection [326 IAC 2-1.1-11]

In the event that filter failure has been observed:

(a) The affected compartments will be shut down immediately until the failed units have been repaired or replaced. Within eight (8) hours of the determination of failure, response steps according to the timetable described in the Preventive Maintenance Plan shall be initiated. For any failure with corresponding response steps and timetable not described in the Preventive Maintenance Plan, response steps shall be devised within eight (8) hours of discovery of the failure and shall include a timetable for completion.

(b) For single compartment filters, failed units and the associated process will be shut down immediately until the failed units have been repaired or replaced.

Record Keeping Requirements

D.6.10 Record Keeping Requirements [326 IAC 2-1.1-11]

(a) To document compliance with condition D.6.7, the Permittee shall maintain records of the following:

(1) Weekly visible emission notations of the bin vent exhaust and raw material receiving station.

(2) Documentation of all response steps implemented for every event that visible emissions were noted to be “abnormal”.

(b) All records shall be maintained in accordance with condition C.14 - General Record Keeping Requirements of this permit.

SECTION D.7 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

a slag handling and processing area (ID# 14) with a maximum rated capacity of 150 tons per hour. This processing area consists of slag pot dumping, deskulling, slag cooling, digging of slag pits by a front-end loader, loading of grizzly feeder by a front-end loader, crushing, screening, conveyor transfer points, loading of materials into piles, storage piles, load out of materials from piles, and vehicle movement around piles. This processing area utilizes the following equipment:

(1) one (1) grizzly/feeder (ID# F-1) with a maximum capacity of 150 tons per hour;

(2) one (1) conveyor (ID# C-1) with a maximum capacity of 150 tons per hour;

(3) one (1) conveyor (ID# C-2) with a maximum capacity of 135 tons per hour;

(4) one (1) single deck screen (ID# SDSC-1) with a maximum capacity of 135 tons per hour;

(5) one (1) primary crusher (ID# CR-1) with a maximum capacity of 15 tons per hour;

(6) one (1) by-pass conveyor (ID# BC-1) with a maximum capacity of 15 tons per hour;

(7) one (1) screen (ID# SC-1) with maximum capacity of 15 tons per hour;

(8) one (1) stacker (ID# ST-1) with a maximum capacity of 6 tons per hour;

(9) two (2) stackers (ID# ST-2 and ST-3), each with a maximum capacity of 3 tons per hour;

(10) one (1) conveyor (ID# C-3) with a maximum capacity of 135 tons per hour;

(11) four (4) stackers (ID#s ST-4 through ST-7), each with a maximum capacity of 33, 42, 30, and 24 tons per hour.

Particulate emissions from the slag processing area are controlled by water suppression and minimizing drop heights.

Particulate emissions from the slag dumping area are controlled by a structure as defined in Section D.7 of this permit.

Emissions Limitation and Standards

D.7.1 Annual Slag Production Limitation [326 IAC 2-1.1-5]

Pursuant to 326 IAC 2-1.1-5, the Permittee shall not process more than 262,800 tons of slag per year.

D.7.2 Particulate Matter (PM) [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), combined filterable PM emissions from the crushing, screening, conveyor transfer points, continuous stacking operations shall not exceed 55.4 pounds per hour. This limit is based on the maximum process weight rate of 150 tons per hour. PM emissions will be considered in compliance with

326 IAC 6-3 in the absence of PM compliance tests provided that visible emissions do not exceed the requirements of condition D.7.3 for these operations.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11}-40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of sixty thousand (60,000) pounds per hour.

D.7.3 Visible Emission Limitations - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), fugitive dust emissions from the various slag handling and processing operations shall be controlled in accordance with the attached Fugitive Dust Control Plan such that the following visible emission limitations are not exceeded:

Slag Handling/Processing Operation	Visible Emission Limitation (% opacity)
Transferring of skull slag to slag pot	10 % opacity, six (6) minute average
Pouring of liquid slag from EAF or LMF to slag pots	3% opacity, six (6) minute average on any building opening
Dumping of liquid slag from slag pot to slag pit and cooling	3 % opacity, six (6) minute average
Transferring of skull slag from slag pot to skull pit	5 % opacity, six (6) minute average
Digging skull slag pits	5 % opacity, six (6) minute average
Digging slag pits	3 % opacity, six (6) minute average
Stockpiling of slag adjacent to the grizzly feeder	3 % opacity, six (6) minute average
Wind erosion of stockpiles	3 % opacity, six (6) minute average
Crushing	3 % opacity, six (6) minute average
Screening	3 % opacity, six (6) minute average
Conveyor transfer points	3 % opacity, six (6) minute average
Continuous stacking of processed slag to stockpiles	3 % opacity, six (6) minute average
Loadout of processed slag from stockpiles to haul trucks for shipment	3 % opacity, six (6) minute average
Inplant hauling of slag pots (filled) and processed slag (this does not include activities covered under section D.8.)	3 % opacity, six (6) minute average

D.7.4 Slag Dumping Fugitive Particulate Matter (PM/PM10) [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the slag dumping pits shall be covered by a partially enclosed, roofed structure to reduce PM emissions during slag dumping. The roof shall extend over the entire slag pit area and past the dump stations. The sides of the structure shall extend sufficiently downward from the roof, taking into account:

(1) reduction of PM emissions during dumping and partial shielding of prevailing winds; and

(2) dissipation of heat and consideration of safety concerns within the structure.

D.7.5 Preventive Maintenance Plan [326 IAC 1-6-3]

A Preventive Maintenance Plan, in accordance with condition B.8 - Preventive Maintenance Plan, of this permit, is required for the slag handling and processing operations and associated control devices.

Compliance Determination Requirements

D.7.6 Testing Requirements [326 IAC 2-1.1-11]

Pursuant to 326 IAC 2-1.1-11, the Permittee shall perform an initial compliance test for opacity on the above-mentioned slag handling and processing operations within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing 40 CFR Part 60, Appendix A, Method 9, or other methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.7.1 and shall be repeated at least once every five (5) years from the date of the valid compliance demonstration.

SECTION D.8 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

transporting on paved roadways and parking lots, unpaved roadways, and unpaved areas around slag storage piles and steel scrap piles.

Emissions Limitation and Standards

D.8.1 Visible Emission Limitations - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), fugitive dust emissions from transporting on paved roadways and parking lots, unpaved roadways, and unpaved areas around slag storage piles and steel scrap piles shall be controlled in accordance with the attached Fugitive Dust Control Plan (Attachment A) such that the following limitations are not exceeded:

(a) Paved surface silt loading shall not exceed 9.7 grams of silt per square meter and the average instantaneous opacity from paved roadways and parking lots shall not exceed ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first will be taken at the time of emission generation.
(2) The second will be taken five (5) seconds later.
(3) The third will be taken five (5) seconds later or ten (10) seconds after the first.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and at approximately right angles to the plume. Each reading shall be taken approximately four (4) feet above the surface of the paved roadway.

(b) Visible emissions from unpaved roadways and unpaved areas around slag storage piles and steel scrap piles shall not exceed an average instantaneous opacity of ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first will be taken at the time of emission generation.
(2) The second will be taken five (5) seconds later.
(3) The third will be taken five (5) seconds later or ten (10) seconds after the first.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and at approximately right angles to the plume. Each reading shall be taken approximately four (4) feet above the surface of the unpaved roadway.

Compliance Determination Requirements

D.8.2 Testing Requirements [326 IAC 2-1.1-11]

Testing of the above-mentioned operations is not required by this permit.

SECTION D.9 EMISSION UNIT OPERATION CONDITIONS

The information describing the processes contained in this description box is descriptive information and does not constitute enforceable conditions.

(a) one (1) cooling tower (ID# 13) with a maximum water flow of 15,000 gallons per minute; and

(b) three (3) locomotives, each with a maximum diesel consumption of 10 gallons per hour.

Emissions Limitation and Standards

D.9.1 Particulate Matter (PM/PM-10) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), filterable PM/PM-10 emissions from the cooling tower shall not exceed 0.008 pound per hour.

D.9.2 Nitrogen Oxides (NO_x) - Air Quality Impact [326 IAC 2-2-5]

Pursuant to 326 IAC 2-2-5 (PSD - Air Quality Impact; Requirements), NO_x emissions from the locomotives shall not exceed 490 pounds per kilogallon of diesel fuel.

Compliance Determination Requirements

D.9.3 Testing Requirements [326 IAC 2-1.1-11]

Testing of the cooling tower and locomotives is not required by this permit.

MALFUNCTION REPORT
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR MANAGEMENT
FAX NUMBER - 317 233-5967

This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE: IT HAS POTENTIAL TO EMIT 25 LBS/HR PARTICULATES ?_____, 100 LBS/HR VOC ?_____, 100 LBS/HR SULFUR DIOXIDE ?_____ OR 2000 LBS/HR OF ANY OTHER POLLUTANT ?_____ EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY:__Steel Dynamics, Inc._____PHONE NO._____

LOCATION: (CITY AND COUNTY)__Columbia City/Whitley_____
PERMIT NO. __183-10097___AFS PLANT ID: _183-00030_____ AFS POINT ID: _____ INSP: _____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON:
_____
_____

DATE/TIME MALFUNCTION STARTED: _____/_____/ 19____ _____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION:
_____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE_____/_____/ 19____ _____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO2, VOC, OTHER: _____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____
_____

MEASURES TAKEN TO MINIMIZE EMISSIONS: _____

_____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL* SERVICES:
_____
CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS:_____
CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT:_____
INTERIM CONTROL MEASURES: (IF APPLICABLE)
_____
_____
_____

MALFUNCTION REPORTED BY: _____TITLE:_____
(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY: _____DATE:_____TIME:_____

FAX NUMBER - 317 233-5967 *SEE REVERSE

Please note - This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.

326 IAC 1-6-1 Applicability of rule

Sec. 1. The requirements of this rule (326 IAC 1-6) shall apply to the owner or operator of any facility which has the potential to emit twenty-five (25) pounds per hour of particulates, one hundred (100) pounds per hour of volatile organic compounds or SO2, or two thousand (2,000) pounds per hour of any other pollutant; or to the owner or operator of any facility with emission control equipment which suffers a malfunction that causes emissions in excess of the applicable limitation.

326 IAC 1-2-39 "Malfunction" definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. (Air Pollution Control Board; 326 IAC 1-2-39; filed Mar 10, 1988, 1:20 p.m. : 11 IR 2373)

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

_____

_____

__

Indiana Department of Environmental Management

Technical Support Document

Response to June 22, 2000 Decision from the Environmental Appeals Board to Prevention of Significant Deterioration (PSD) Permit Issued to Steel Dynamics, Inc.

The Environmental Appeals Board (Board) remanded in its June 22, 2000 Decision[1] the following three components of the Prevention of Significant Deterioration (PSD) permit issued by the Indiana Department of Environmental Management (IDEM) to Steel Dynamics, Inc. (SDI) for further consideration:

- IDEM must provide in the administrative record a clear rationale for its treatment of the condensible fraction of lead, including documentation of its decision making process and the data upon which its decisions are based. IDEM also must consider and respond to the Union's alternative calculation of a PTE lead of 4.03 tons per year;

- IDEM must perform a complete analysis of SCR's cost-effectiveness as applied to SDI's reheat furnace (including comparisons of costs to other facilities and to other technologies), document its findings, submit those findings to public review, and consider and respond to significant public comments in its documentation of the final permit decision; and

- IDEM must reconsider the BACT limitations chosen for NOx and CO emissions from the EAF. IDEM must explain why the limits it imposed are in lbs/hr (rather than in lbs/hr and lbs/ton, or lbs/ton alone), in particular explaining the differences (if any) between SDI's proposed mill and the fifteen similar mills that would justify exclusive lbs/hr limits for CO and NOx. Alternatively, IDEM is ordered to impose production limits in addition to the hourly limits for these pollutants.

The following detailed review from IDEM addresses these three remands presented by the Board. Based on the results of this review, IDEM further supports its determination that the potential to emit lead from the EAF and meltshop operations falls below the PSD significant threshold level. IDEM has also presented for the record an extensive detailed cost analysis that further supports that the application of the SCR technology on the reheat furnace is economically infeasible. This determination is consistent with other BACT decisions made for similar facilities as demonstrated in this document. With respect to the EAF NOx and CO emission limits, IDEM has revised the permit to include production-based emission limits for NOx and CO as BACT for the EAF.[2]

A REMAND ISSUE 1 - LEAD EMISSIONS FROM ELECTRIC ARC FURNACE

IDEM must provide in the administrative record a clear rationale for its treatment of the condensible fraction of lead, including documentation of its decision making process and the data upon which its decisions are based. IDEM also must consider and respond to the Union's alternative calculation of a PTE lead of 4.03 tons per year.

The following information provides specific documentation regarding the basis for IDEM's original lead emission estimates. Based on this information, the IDEM acknowledges a specific (but, in the

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1 See the Environmental Appeals Board's Order Granting Review In Part and Denying Review In Part, decided June 22, 2000. (Attachment 1)

2 In addition to the following discussion in this TSD, the permit documents and supporting information from the July 7, 1999 permit decision are hereby incorporated by reference.

end, insignificant) error in the estimates of the condensible lead stack emissions, and provides new information for the record regarding total lead (filterable + condensible) which supports the original conclusion that the proposed SDI facility will not exceed 0.6 tons per year of lead. In particular, the new data from actual measurements of filterable plus condensible lead emission levels from recently constructed similar sources provides a far superior basis for decisionmaking than past estimates based on assumptions drawn from particulate rather than lead emissions data, and from assumptions regarding the relative fraction of condensible emissions.

A.1 Lead Emission Calculation Evaluation from the EAF

The following provides an administrative record of the IDEM's rationale for its treatment of lead emissions from the EAF operations, including documentation of its decision making process and the data upon which its decisions were based.

A.1.1 Original Lead Emission Calculations

	Stack Pb Emissions				Fugitive Pb Emissions		Total Pb Emissions	
	Filterable		Condensible					
Parameters Used:	0.005	lb Pb/lb EAF dust	10.8	lb total PM/hour	1.4	lb PM/ton steel		
	40	lb EAF dust/ton steel	0.65	lb condens PM/lb total PM	0.005	lb Pb/lb PM		
	99.85	% Efficiency						
	200	tons steel/hour	0.005	lb Pb/lb condens PM	200	tons steel/hr		
Pb Emissions:	0.06	lbs/hr	0.035	lbs/hr	0.0068	lbs/hr	0.102	lbs/hr
	0.263	tons/yr	0.154	tons/yr	0.03	tons/yr	0.45	tons/yr

Filterable Stack Lead Emission Calculations:
0.005 lbs Pb/lb EAF dust x 40 lb EAF dust/ton steel = 0.2 lb Pb/ton steel, uncontrolled
0.2 lbs Pb/ton steel x (1 - 0.9985 removal efficiency) = 0.0003 lbs Pb/ton steel, controlled
0.0003 lbs Pb/ton steel x 200 ton steel/hour = 0.06 lbs filterable Pb/hour
0.06 lbs filterable Pb/hr x 8760 hr/yr x 1 ton/2000 lbs = **0.263 tons filterable Pb/year**

Condensible Stack Lead Emission Calculations:
10.8 lbs total PM/hr x 0.65 lbs condens PM/lbs total PM = 7.02 lbs condens PM/hour
7.02 lbs condens PM/hr x 0.005 lbs Pb/lbs condens PM = 0.0351 lbs condens Pb/hour
0.0351 lbs condens Pb/hr x 8760 hr/year x 1 ton/2000 lbs = **0.154 tons condens Pb/year**

Fugitive Lead Emission Calculations:
1.4 lbs PM/ton steel x 0.005 lb Pb/lb PM x 200 ton steel/hr = 0.0068 lbs fugitive Pb/hour
0.0068 lbs Pb/hr x 8760 hr/yr x 1 ton/2000 lbs = **0.03 tons fugitive Pb/year**

Total Lead Emission Calculations:
0.06 lbs filt Pb/hr + 0.0351 lbs condens Pb/hr + 0.008 lbs fug Pb/hr = 0.095 lbs total Pb/hour
0.263 tons filt Pb/yr + 0.154 tons condens Pb/yr + 0.03 tons fug Pb/yr = **0.45 tons total Pb/year**

A.1.2 Resources Used to Calculate Original Lead Emissions

Parameters for Filterable Pb Emissions from Stack		Resource	Parameters for Condensible Pb Emissions from Stack		Resource	Parameters for Fugitive Pb Emissions		Resource
0.005	lb Pb/lb EAF dust	Composite EAF Dust Sampling	10.8	lb total PM/hour	Consistent with similar Indiana BACT sources	1.4	lb PM/ ton steel	AP-42
40	lb EAF dust/ton steel	Consistent with similar Indiana BACT sources	0.65	lb condens PM/lb total PM	Consistent with PM Stack Tests for Similar Source	0.005	lb Pb/lb PM	Consistent with % Pb in Filt PM Fraction
99.85	% Eff	Consistent with similar Indiana BACT sources						
200	tons steel/hr	Equipment Capacity	0.005	lb Pb/lb condens PM	Consistent with % Pb in Filt PM Fraction	200	tons steel/hr	Equipment Capacity

Filterable Lead Analysis from Stack:
The original construction permit application submitted by SDI provided calculations for the filterable lead emissions generated from the EAF. It should be noted that the lead calculations represent emissions from the meltshop operations, not just the EAF. The facilities that make up the meltshop operations consist of the EAF (electric arc furnace), LMS (ladle metallurgical station), and CC (continuous caster). The original calculations provided by SDI were based on the following resources which were accepted by the IDEM:

(1) The percent lead in the EAF dust was derived from monthly composite samples taken from the EAF dust at the SDI facility in Butler, Indiana for operations in Spring 1998, as summarized in the following table.[3]

Month	% Lead
May 1998	0.27
June 1998	0.24
July 1998	0.42
August 1998	0.40
Average % Lead	0.33

SDI used the above information and provided a safety factor of 1.5 to make a conservative estimate. Based on this information, the IDEM accepted the proposed **0.5 percent lead** used in the permit application.

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3 See the results of composite EAF dust analyses from meltshop operations during Spring 1998 at the SDI - Butler facility, Indiana. (Attachment A-1)

(2) To determine the amount of EAF dust generated from each ton of steel produced, SDI relied upon the following information obtained from Indiana permits from sources with similar process operations.[4]

Source	Permit No.	lbs EAF dust/ton steel produced
Qualitech Steel; Hendricks Co., IN	CP-063-6093-00037	35
Beta Steel; Porter Co., IN	CP-127-2326-00036	50
Nucor Steel; Montgomery Co., IN	CP-107-2764-00038	37.5
SDI - Butler Dekalb Co., IN	CP-033-8091-00043	40
Average Emission Factor, lb dust/ton steel		40.6

Based on the above information, SDI proposed 40 pounds of EAF dust generated from each ton of steel produced as shown in the permit application. This information is consistent with the following uncontrolled particulate matter emission factors from EAF operations:

EPA Resource [5]	Uncontrolled Particulate from EAFs (lb PM/ton steel)
AP-42 (Information collected up to 1986)	50
FIRE Version 5.0 (Information collected up to 1990))	40.7

4 See permit documentation for similar Indiana facilities relating to lead emissions from meltshop operations. (Attachment A-2)

5 See Compilation of Air Pollutant Emission Factors (AP-42), EPA, 5th ed., January 1995, Vol. 1: Stationary Point and Area Sources, Section 12.5: Iron and Steel Production, Table 12.5-1: Particulate Emission Factors for Iron and Steel Mills (Uncontrolled EAF emissions from Melting and Refining, and Charging, Tapping and Slagging). (Attachment A-3)

See Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, EPA, FIRE Version 5.0, August 1995, SCC 3-03-009: Steel Manufacturing, SCC 30300908: Electric Arc Furnace: Carbon Steel. (Attachment A-3)

Condensible Lead Analysis from Stack:
To address concerns about possible condensible lead emitted from the EAF, the IDEM used the following sources of information to calculate a conservative estimate of condensible lead emissions.[6]
It should be noted that the lead calculations represent emissions from the meltshop operations, not just the EAF. The facilities that make up the meltshop operations consist of the EAF, LMS, and CC.

Source	Test Date	Filterable PM	Condensible PM	Total Stack PM	% Condens-ible PM Fraction
Qualitech Steel; Hendricks Co., IN CP-063-6093-00037	Permit only requires filterable (Method 5) testing				
Beta Steel; Porter Co., IN CP-127-2326-00036	1/19/98	1.65 lb/hr	2.83 lb/hr	4.48 lb/hr	63%
Nucor Steel; Montgomery Co., IN CP-107-2764-00038	Permit only requires filterable (Method 5) testing				
SDI - Butler Dekalb Co., IN CP-033-8091-00043	4/17-18/97	0.0009 gr/dscf	0.0013 gr/dscf	0.0022 gr/dscf	59%
	11/17-20/98	11.75 lb/hr	21.39 lb/hr	33.14 lb/hr	65%
Average % Condensible PM from Meltshop:					62%

The above stack test results were used to support the total stack particulate emission estimate for the EAF at the proposed SDI - Whitley County facility:

Total PM = 0.0018 gr/dscf filterable PM / (0.35 filterable PM/total PM)
= 0.0052 gr/dscf total PM

Condensible PM = 0.0052 gr/dscf total PM - 0.0018 gr/dscf filterable PM
= 0.0034 gr/dscf condensible PM

% Condensible PM = 0.0034 gr/dscf condens PM / 0.0052 gr/dscf total PM
= **65%**

The IDEM assumed that the same percentage of lead found in the filterable fraction (0.5%) would also be present in the condensible fraction.

Fugitive Lead Analysis:
The original construction permit application submitted by SDI provided calculations for the fugitive lead emissions generated from the EAF. The original calculations provided by SDI were based on the following resources which were accepted by the IDEM:
(1) The following particulate information was used to calculate the uncontrolled fugitive lead

6 See particulate stack test summary reports for similar Indiana sources relating to meltshop operations. (Attachment A-4)

emission estimate from the EAF at the proposed SDI - Whitley County facility:

Resource [7]		Uncontrolled Particulate (Fugitive) Emissions (lb PM/ton steel)
AP-42	Charging, Tapping and Slagging - Emissions escaping monitor	1.4

AP-42 evaluates particulate emissions from two operating phases of the EAF including the melting and refining phase and the charging, tapping and slagging phase. At the proposed SDI - Whitley County facility, the emissions generated during the melting and refining phase of the EAF operation are controlled by a direct shell "fourth hole" evacuation system and a canopy hood acts as a secondary capture system. The combined system has a capture efficiency of nearly 100 percent and and therefore fugitives emissions are negligible from this phase of the EAF operation.

The charging, tapping and slagging operations from the EAF operation are controlled by a canopy hood. The AP-42 particulate emission estimate for the charging, tapping and slagging phase represents those emissions not captured by the canopy hood control system (i.e. fugitives). Based on the information obtained from AP-42, this represents approximately 90 percent capture efficiency from the canopy hood:

EAF Activity	Emission Rate (lb PM/ton steel)	Resource
Melting, Refining, Charging, Tapping, and Slagging - Uncontrolled for Carbon Steel	50	AP-42, Table 12.5-1
Melting and Refining - Uncontrolled for Carbon Steel	38	AP-42, Table 12.5-1
Charging, Tapping, and Slagging - Uncontrolled for Carbon Steel	12	Calculated: (Melting Refining, Charging, Tapping and Slagging - Melting & Refining) - Uncontrolled
Charging, Tapping and Slagging - Emissions Escaping Monitor (Fugitives Not Captured)	1.4	AP-42, Table 12.5-1
Charging, Tapping, and Slagging - Captured Emissions	10.6	Calculated: (Charging, Tapping, and Slagging - Uncontrolled (12 lb/ton) - Fugitives Not Captured from Charging, Tapping, and Slagging (1.4 lb/ton))
Percent Emissions Captured from Charging, Tapping, and Slagging	88.3%	Calculated: (Emissions Captured (10.6 lb/ton) / Total Emissions (12 lb/ton))

The AP-42 value used to calculate fugitive emissions is very conservative because BACT requires a higher capture efficiency of more than 99 percent. Based on the information

7 See Compilation of Air Pollutant Emission Factors (AP-42), EPA, 5th ed., January 1995, Vol. 1: Stationary Point and Area Sources, Section 12.5: Iron and Steel Production, Table 12.5-1: Particulate Emission Factors for Iron and Steel Mills (Uncontrolled EAF emissions from Melting and Refining, and Charging, Tapping and Slagging). (Attachment A-3)

See Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, EPA, FIRE Version 5.0, August 1995, SCC 3-03-009: Steel Manufacturing, SCC 30300908: Electric Arc Furnace: Carbon Steel. (Attachment A-3)

presented above, a conservative emission rate of **1.4 lbs PM/ton** of steel processed was used to calculate fugitive particulate and lead emissions.

(2) To determine the percent lead in the fugitive particulate emissions from the EAF, IDEM accepted information obtained from composite samples of EAF dust at the SDI facility in Butler, Indiana, as summarized in the *Filterable Lead Analysis* section above. Based on this information, the IDEM accepted the proposed **0.5 percent lead** used in the permit application for the fugitive lead emission estimate from the EAF operation.

A.1.3 Acknowledgment of Oversight in Lead Emission Calculations

Upon evaluation of the detailed lead emission calculations shown in Section .1.3, the IDEM observed an oversight in the condensible lead stack emission calculation. The filterable particulate emissions, rather than the condensible particualte emissions, were used along with assumptions related to the condensible particulate emission fraction to calculate the condensible lead emissions.

Filterable PM/PM_{10} BACT Limitation:
0.0018 gr/dscf x lbs filterable PM/PM_{10} / 7000 gr x 700,000 dscf/min
x 60 min/hr = 10.8 lbs/hr filterable PM/PM_{10}

Total PM/PM_{10} BACT Limitation:
0.0052 gr/dscf x lbs filterable PM/PM_{10} / 7000 gr x 700,000 dscf/min
x 60 min/hr = 31.2 lbs/hr total (filterable + condensible) PM/PM_{10}

Calculated Condensible PM/PM_{10} Limitation:
Total PM/PM_{10} - Filterable PM/PM_{10} = Condensible PM/PM_{10} Emissions
31.2 lbs total PM/PM_{10} - 10.8 lbs/hr filterable PM/PM_{10} = 20.4 lb/hr condensible PM/PM_{10}

Calculated Condensible Lead Emissions:
10.8 lbs total PM/hr x 0.65 lbs condens PM/lbs total PM = 7.02 lbs condens PM/hour
7.02 lbs condens PM/hr x 0.005 lbs Pb/lbs condens PM = 0.0351 lbs condens Pb/hour
0.0351 lbs condens Pb/hr x 8760 hr/year x 1 ton/2000 lbs = **0.154 tons condens Pb/year**

The particulate emission calculations from the EAF stack included in the technical support document of the final permit only report the filterable particulate emissions fraction from the meltshop.[8] Only the filterable particulate fraction was reported because the calculation exercise was to show the *controlled* emissions from the baghouse. Condensible particulate cannot be completely controlled by a baghouse because it is in a gaseous state, and as a result these gases pass through a baghouse filter. The temperature, residence time, nuclei availability and partial pressure conditions affect the ratio of filterable to condensible particulate matter and lead emissions.

The IDEM recognizes that based upon concerns with the condensible particulate and condensible lead emissions, a second emission calculation table should have been included in the technical support document of the final permit. However, it should be noted that both condensible and filterable particulate and lead emission limitations from the stack exhaust are required by the

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8 See Appendix A of the Technical Support Document to the SDI - Whitley County construction permit (CP-183-10097-00030). (Attachment A-5)

construction permit (Operation Conditions D.1.6(b) and D.1.11(a)) and the air quality modeling analysis evaluated particulate and lead emissions from the meltshop stack exhaust. The IDEM conducted the lead air quality modeling analysis even though it was not required by state and federal PSD regulations to ensure compliance with the National Ambient Air Quality Standards (NAAQS) for lead.

A.1.4 New Lead Emission Information Presented to the Record

As a result of the EAB remand, the IDEM further investigated the expected lead emissions from the meltshop operations. To determine the most appropriate methodology approach, the IDEM first scrutinized its own calculated emission estimate. Setting aside the oversight discussed above, many of the variables used to calculate the lead emission estimate are based on conservative assumptions. For example, the expected percent condensible fraction for lead was determined from the results of the most recent stack test results for condensible PM performed at the SDI - Butler facility in Indiana. IDEM used this information to estimate condensible lead emissions from the facility. However, it is expected that the percent of condensible lead would be much lower than the percent condensible PM due to the temperature, residence time, nuclei availability and partial pressure conditions associated with the EAF.[9]

Conservative assumptions are an accepted state and federal practice to estimate emissions, but again these calculations only represent an estimation of emissions. Because conservative assumptions are made, it is reasonable to *assume* that the calculated emission estimate encompasses all of the actual emissions. During the public process, there were a number of methodology approaches suggested, all with assumptions made and all resulting in different emission results.

Because of the variability associated with the calculated emission estimates, the IDEM thought it appropriate to follow a BACT analysis format to investigate similar sources and their respective evaluation of lead. The IDEM chose those sources evaluated in the original PM BACT review. This set of sources was selected because lead is a subset of particulate matter and the same control technologies would apply. These sources also represent current control practices and emission limitations from relatively new facilities, unlike the RTI data collected prior to 1993.

As a result of this exercise, IDEM obtained concrete data from direct lead emissions measurements to support that total (filterable + condensible) stack emissions of lead from meltshop operations (i.e., EAF, LMS, and CC) are well below the PSD significant threshold level for lead. Utilizing stack test information to estimate emissions is another accepted state and federal method. This information provides a more accurate representation of the lead emissions from the meltshop operations than calculated lead emission estimates and eliminates the need for any assumptions on the amount of lead, if any, present in the condensible fraction. The following table and discussion provide detailed information that support the use of stack test results over other approaches to calculating lead emissions:

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9 See “On the Likelihood of Condensible Lead Emissions in the Off-gas Stream of an Electric Arc Furnace”, Dr. Ranajit Sahu, August 19, 2000. (Attachment A-6)

Facility	Pb Limit	Compliance Information	PM/PM10 and/or Pb BACT Information	
			Capture	Control
Arkansas Steel; AR Issued after 1995	Stack: 0.4 lb/hr, 1.5 tpy Fugitive: 0.3 lb/hr, 0.8 tpy Limits established for meltshop operations (i.e., EAF, LMS, CC) Permit requires Method 12 test or baghouse dust analysis	3/9-10/99 Test: Pb: 0.078 lb/hr (0.34 tpy) (Method 12 Used) (No throughput given)	Direct Evacuation System + Canopy Hood	Pos. pressure shaker-type baghouse using polyester or nomex bags
Gallatin Steel; KY Issued on 12/16/97	Stack: 0.162 lb/hr (0.7 tpy), 0.00081 lb/ton Limits established for meltshop operations (i.e., EAF, LMS, CC) Permit requires testing, but no test method given	2/18-22/98 Test: Pb: 0.014 lbs/hr (0.06 tpy) @ 154 tph steel rate (Method 12 Used)	Direct Evacuation System + Canopy Hood	Pos. pressure baghouse
IPSCO Steel; IA Issued on 8/14/96	0.09 lb/hr, 0.38 tpy @ 164 tph steel; 0.11 lb/hr, 0.49 tpy @ 200 tph steel; 0.13 lb/hr, 0.55 tpy @ 230 tph steel (Limits for meltshop operations) Permit requires Method 12 test	11/17-19/98 Test: Pb: 0.00037 lb/ton @ 120 tph steel (0.044 lb/hr, 0.19 tpy)	Skirted canopy hood above the closed EAF shop	Neg. pressure, pulse-jet baghouse using polyester bags + scrap mgmt. plan 99.7% control eff.
Nucor Steel; Huger, SC Issued on 8/16/95	0.0003675 lb/ton steel, 0.184 lb/hr, 0.81 tpy Limits established for meltshop operations Permit requires Method 12 test	5/14/97 Test: Pb: 0.04 lb/hr (0.175 tpy), 0.00022 lb/ton @ 184 tph steel rate 8/5-7/97 Test: Pb: 0.047 lb/hr (0.206 tpy), 0.00024 lb/ton @ 202 tph steel rate	Direct Evacuation System + Canopy Hood	Neg. pressure baghouse
Nucor Steel; AR Issued on 5/14/91	0.49 lb/hr, 2.13 tpy (Limits established for meltshop operations) Permit requires Method 12 test or alt method approved by Dept	Information not Available	Direct Evacuation System + Canopy Hood	Multicompart-ment, pos. pressure, reverse air baghouse
Nucor-Yamato Steel; AR Issued on 4/27/92; Last Expansion after 10/4/95	0.388 lb/hr, 1.70 tpy (Limits established for meltshop operations) Permit requires annual Method 12 test or alternate method approved by Dept	7/97 Test: Pb South: 0.0144 lb/hr (0.063 tpy), 2.73EE-6 gr/dscf Pb North: 0.00728 lb/hr (0.032 tpy), 2.48EE-6 gr/dscf	Direct Evacuation System + Canopy Hood	Multi-compartment, reverse air, pos. pressure baghouse
Quanex - Mac Steel; AR	0.3 lb/hr, 1.0 tpy (Limits established for meltshop operations) Permit requires annual Method 12 Test or baghouse dust test	Information not Available	Direct Evacuation System + Canopy Hood	Pos. pressure baghouse
Qualitech Steel; IN Issued on 10/31/96	0.07 lb/hr, 0.31 tpy (Calculations show that fugitive Pb emissions are 0.11 tpy) (Limits established for meltshop)	9/8/99 Test: Pb: 0.032 lb/hr (0.14 tpy) @ 72.8 tph steel (Method 12 Used)	Direct Evacuation System + Canopy Hood	Neg. pressure baghouse

NOTE: Information in parentheses is not specifically stated in the permit, but is based on information obtained from technical support documentation or information reported by the associated state agency.

The sources listed above represent those sources from the PM/PM_{10} BACT table that performed

stack tests for lead.[10] The emission test data from all of the sources listed above demonstrated compliance with their respective allowable Pb limits, resulted in annual Pb emissions less than the significant PSD threshold level for lead (<0.6 tpy), and utilized Method 12, an approved EPA test method for lead. Method 12 collects both particulate (filterable) and gaseous (condensible) lead emissions to analyze the total lead emissions from an exhaust stream.[11] The following emission factors for total lead (filterable + condensible) were developed from the lead emission test data available from those recently permitted BACT facilities:

Facility	Pb Emissions from Test (lbs/hour)	Steel Production Rate during Test (tons/hour)	Pb Emission Factor (lbs Pb/ton steel)	Calculated Pb Emissions for SDI	
				lb/hr	tpy
Arkansas Steel, AR	0.078	Not Reported	-----		
Gallatin Steel; KY	0.014	154	0.00009	0.018	0.079
IPSCO Steel; IA	0.044	120	0.00037	0.074	0.324
Nucor; Huger, SC	0.04 0.047	184 202	0.00022 0.00024	0.044 0.048	0.193 0.210
Nucor-Yamato; AR	0.0144 0.00728	Not Reported	-----		
Qualitech Steel; IN	0.032	72.8	0.00044	0.088	0.385
Average Emission Factor, lb/ton steel:			0.00027	0.054	0.238

Calculations:

$$\text{Emission Factor from Test Data, lb Pb/ton steel} = \frac{\text{Pb Emissions from Test (lbs Pb/hr)}}{\text{Steel Production Rate during Test (tons steel/hr)}}$$

$$\text{Controlled Pb Emissions from SDI Meltshop, lb/hr} = \text{Emission Factor from test data (lbs Pb/ton steel)} \times \text{Max SDI Steel Rate (200 tons steel/hour)}$$

Based on the new condensible lead emission information presented above, the following table demonstrates that the lead emissions for both stack and fugitive emissions fall below the PSD significant threshold level for lead:

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[10] See PM BACT documentation from Appendix B of the Technical Support Document to the SDI - Whitley County construction permit (CP-183-10097-00030). (Attachment A-7)

See available lead stack test information from EAFs and meltshop operations from the list of similar sources stated in the PM BACT documentation from Appendix B of the Technical Support Document to the SDI - Whitley County construction permit (CP-183-10097-00030). (Attachment A-7)

[11] See EPA Code of Federal Regulations, 40 CFR 60, Appendix A - Test Methods, Method 12 - Determination of inorganic lead emissions from stationary sources. (Attachment A-8)

Stack Lead Emissions		Fugitive Lead Emissions	Total Lead Emissions	PSD Significant Threshold Level
Filterable	Condensible			
0.238 tons/year		0.03 tons/year	0.241 tons/year	0.6 tons/year

It should be noted that even though the BACT provisions do not directly apply, BACT-level controls are being required to limit PTE below the PSD significant threshold level (0.6 tons Pb/year). Furthermore, as discussed above, the permit establishes a lead emissions limit and requires stack testing to demonstrate compliance with the limit. Because Method 12 accounts for both the filterable and condensible lead fractions, it addresses those concerns relating to the total lead emissions from the stack.

A.2 Potential to Emit and Limiting Potential to Emit

As a result of the lead emission calculation estimates, IDEM required federally enforceable permit conditions which are also enforceable as a practical matter, where appropriate. Those federally enforceable limitations required in the SDI permit are consistent with the federal and state definition of PTE, and EPA guidance on limiting PTE. PTE is defined as "the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operations or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable."[12]

According to the June 13, 1989 EPA guidance document entitled "Limiting Potential to Emit in New Source Permitting", any permit limitation can legally restrict PTE if it is (1) federally enforceable (i.e., contained in a permit issued pursuant to an EPA-approved permitting program), and (2) it is enforceable as a practical matter.[12]

With respect to the lead emissions from the EAF, the limitations required by the SDI permit meet both of these criteria established in the EPA guidance document. First, the SDI permit requires a short-term lead emission limit (Condition D.1.11). This limitation is achievable because the controlled emission calculations demonstrate that emissions are below the PSD significant threshold level. Second, the permit requires that SDI perform a stack test to demonstrate compliance with this lead limitation (Condition D.1.15). Finally, the permit requires that SDI monitor the meltshop baghouse, meltshop baghouse stack, and the meltshop roof monitor to demonstrate continuous compliance with the particulate (and therefore lead) emission limit.

These permit requirements are federally enforceable because this PSD permit was public noticed which allowed the public, as well as EPA, to review and comment on the conditions of the permit. The limitations are enforceable as a practical matter because the baghouse must be monitored to demonstrate that it is operating within the ranges determined by a compliant stack test (Conditions D.1.18, D.1.19, D.1.20, and D.1.21). In addition, other parameters such as daily visible emission observations from the roof monitor and continuous opacity monitoring from the baghouse stack serve as surrogate tools for demonstrating continuous compliance with particulate (and therefore lead) emissions (Condition D.1.17).

A.3 IDEM Recommendations Relating to Stack and Fugitive Lead Emissions from the Meltshop

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[12] See "Potential to Emit" definition, 40 CFR 52.21(b)(4) and 326 IAC 2-1.1-1(16) and Limiting Potential to Emit in New Source Permitting, EPA, June 13, 1989. (Attachment A-9)

In the PSD construction permit that was issued to SDI, there were various monitoring conditions to demonstrate compliance with the lead emission limitation. The following clarifications have been added to the conditions relating to the lead emission limit for the meltshop operations as well as compliance monitoring requirements. These conditions satisfy the federal and state PTE requirements because these conditions are federally enforceable and practically enforceable (bold typeface characters represent additions to the original conditions of the permit and strikeout characters represent deletions from the original conditions to the permit):

D.1.11 Hazardous Air Pollutant (HAP) Limitations

Subject to Condition C.18 of this permit, the Permittee shall not allow:

(a) **stack and fugitive** lead to be emitted from the ~~EAF stack~~ **meltshop operations (EAF, LMS, and CC)** in a quantity equal to or greater than 0.134 pounds per hour.

D.1.15 Testing Requirements

(d) Pursuant to 326 IAC 2-1.1-11, the Permittee shall perform speciation tests from the EAF stack for emissions of HAPs listed under Section 112(b) of the CAA within 60 days after achieving maximum capacity, but no later than 180 days after initial start up, utilizing methods as approved by the Commissioner. These tests shall be performed to gather information on HAP emissions from the EAF stack and to demonstrate compliance with condition D.1.11 of this permit. The information shall include, at a minimum, results for hexane, toluene, benzene, formaldehyde, fluorides, naphthalene, arsenic compounds, beryllium compounds, cadmium compounds, chromium compounds, lead compounds, manganese compounds, mercury compounds, nickel compounds, and selenium compounds. **The Permittee shall stack test lead compounds utilizing Method 12.**

A.4 IDEM Response to Union's Alternative Lead Emission Calculations from the EAF

The Plumbers & Steamfitters Union Local 166, through their consultant Dr. Fox, provided calculations that resulted in a lead emission estimate of 4.03 tons per year, based on a "controlled" emission factor of 0.0046 pounds of lead/ton of steel produced:

$$\frac{0.0046 \text{ lbs Pb/ton steel} \times 200 \text{ tons steel/hr} \times 8760 \text{ hr/year}}{2000 \text{ lbs/ton}} = 4.03 \text{ tons Pb/year}$$

The controlled emission factor relied on by Dr. Fox is based on the 1993 RTI Report for HAP emissions associated with EAF operations. It should first be pointed out that nowhere in the RTI report is an emission factor of 0.0046 pounds of lead/ton of steel produced reported. Based on Dr. Fox's comments, it appears that she elected to use the following 16 sources (out of 42 sources with reported lead emissions) from the RTI report.[13]

[13] See Detailed Summary of Information Collection Request Responses for Electric Arc Furnace (EAF) NESHAP, Research Triangle Institute (RTI), February 1, 1993. (Attachment A-10)

No.	Facility	Pb Emissions, Stack+Fugitive (tons Pb/yr)	Annual Pb Production (tons steel/yr)	Emission Factor (lb Pb/ton steel)	Capture Device *
Non-Stainless Steel Facilities:					
1	Arkansas Steel; Newport, AR	0.31	97,100	0.0064	sd
2	Birmingham Steel; Birmingham, AL	1.21	336,000	0.0072	4h, tbe
3	Cascade Steel; McMinnville, OR	0.0164	368,300	0.000089	4h, c
4	Charter Steel; Saukville, WI	0.0004	160,000	0.000005	4h, c, tbe
5	Florida Steel; Baldwin, FL	1.51	431,790	0.0070	4h, c
					tbe
					tbe
6	Florida Steel; Charlotte, NC	0.969	259,000	0.0075	4h, c, tbe
					4h, c, tbe
					4h, c, tbe
					tbe
7	Florida Steel; Jackson, TN	1.67	420,000	0.0080	4h, c, tbe
8	Florida Steel; Tampa, FL	0.755	200,000	0.0076	4h, c, tbe
					4h, c, tbe
					4h, c, tbe
					4h, c, tbe
9	New Jersey Steel; Sayreville, NJ	0.48	932,000	0.0010	4h, c
10	North Star Steel; Wilton, LA	0.65	330,000	0.0039	4h, c
11	Nucor Steel; Darlington, SC	0.829	400,000	0.0041	sd, ladle
					4h, c
					sd
12	Nucor Steel; Jewett, TX	3.07	500,000	0.0123	sd, c
13	Nucor Steel; Plymouth, UT	1.81	503,888	0.0072	4h

No.	Facility	Pb Emissions, Stack+Fugitive (tons Pb/yr)	Annual Pb Production (tons steel/yr)	Emission Factor (lb Pb/ton steel)	Capture Device *
14	Structural Metals; Seguin, TX	0.0348	593,000	0.00012	4h, c
					4h c
Stainless Steel Facilities:					
15	J&L Specialty; Midland, PA	0.226	400,000	0.0011	4h, c
16	Republic Steel; Canton, OH	0.02	1,100,000	0.00004	tbe
Average Pb Emission Factor, lb/ton:				0.0046	

* Acronym Definitions: 4h - 4th Hole Evacuation System; c - Canopy;
sd - Side Draft Evacuation System; tbe - Total Building Enclosure

Dr. Fox selected the above-mentioned RTI sources because the data was reported to have been based on testing. These 16 sources included 14 non-stainless steel facilities and 2 stainless steel facilities. From this data set, she added the reported stack and fugitive annual lead emissions, and divided by the reported annual steel production numbers. She then averaged the calculated values for the 16 sources. While we have been able to reproduce the results of her calculations, Dr. Fox does not explicitly document her methodology in her comments, and the RTI report itself does not attempt to perform such calculations.

The RTI report on EAF operations was developed to fulfill the requirements of Section 112(c) and (e) of the Clean Air Act Amendments of 1990. The Act required that a list of specific source categories of hazardous air pollutants (HAPs) be developed within 12 months after the date of enactment and HAP emission standards be developed once the initial list was formulated. The initial list, which included EAF operations, was published in the Federal Register on July 16, 1992 (57 Fed.Reg. 31576). The EPA contracted RTI to compile and present data on HAP emissions associated with EAF operations. The RTI report was submitted to EPA on February 1, 1993. Upon review of this information, the EPA formally removed this source category from the initial list in the Federal Register published on June 4, 1996 (61 Fed.Reg. 28197) because none of the existing EAF operations qualified as a major HAP source (>10 tons/year for a single HAP or >25 tons/year for a combination of HAPs).[14]

Based on those facilities used by Dr. Fox, it appears that Structural Metals in Texas operates a similar facility to the proposed SDI - Whitley County plant in terms of PM control because the capture and control technologies are the same and both produce similar products. Applying the emission factor developed from the Structural Metals information to the proposed SDI facility, the calculated lead emissions based on SDI's proposed maximum production capacity results in emissions that are less than the PSD significant threshold level for lead (0.6 tons/year):

[14] See Federal Register, 61 Fed.Reg. 28197, June 4, 1996. (Attachment A-11)

Pb Emission Rate = 0.00021 lb Pb/ton steel (Structural Metals) x 200 tons steel/hour (SDI)
= 0.042 lbs Pb/hour x 8760 hours/year x 1 ton/2000 lbs
= 0.184 tons Pb/year

Based on the example presented above for Structural Metals in Texas, this would be the best controlled similar source, which is less than the significant PSD threshold level for lead. Therefore, it is reasonable to assume that the estimate made by the state is reasonable for a well-controlled, similar source, and that the proposed limit is in fact achievable.

In fact, four of the 16 source emission factors, when applied to the steel production rate at the proposed SDI - Whitley County facility, are below the PSD significant threshold level for lead (0.6 tons/year). These sources represent the best controlled sources:

No.	Facility	Emission Limitation (lb Pb/ton steel)	Calculated Pb Emissions for SDI	
			lb/hr	ton/year
1	Charter Steel; Saukville, WI	0.000005	0.001	0.0044
2	Cascade Steel; McMinnville, OR	0.000089	0.0178	0.078
3	Republic Steel; Canton, OH	0.00004	0.008	0.035
4	Structural Metals; Seguin, TX	0.00012	0.024	0.105

As shown in the above exercise, there are other methodology approaches that can be used to evaluate the lead emissions from the RTI data which demonstrate that emissions are below the PSD significant threshold level for lead. Regardless of this exercise, there are multiple problems with using data like that presented in the RTI report as a reliable source of information on which to base an emission factor, because there are too many unknown variables:

- No specific stack test methods stated in the RTI Report
- No analytical methods used to measure the lead stated in the RTI Report
- No actual production rates during the stack tests provided in the RTI Report
- No information on the permit issuance, permit emission limits for lead or other permit conditions for the baghouse or other control device reported in the RTI Report
- No compliance demonstration with applicable limits shown in the RTI Report
- No design information on the control device efficiencies stated in the RTI Report

Absent a critical review of these factors, it is not reasonable to use data from these other sources as representative of the expected control levels that will be achieved by the proposed SDI facility.

B REMAND ISSUE 2 - SCR COST ANALYSIS FOR REHEAT FURNACE

IDEM must perform a complete analysis of SCR's cost-effectiveness as applied to SDI's reheat furnace (including comparisons of costs to other facilities and to other technologies), document its findings, submit those findings to public review, and consider and respond to significant public comments in its documentation of the final permit decision.

The following information provides specific documentation regarding the detailed SCR cost proposal

for the proposed SDI facility. IDEM has been in constant contact with U.S. EPA and has carefully analyzed the SDI-specific SCR vendor bid and related costs, the information available on Beta Steel and the reheat furnace BACT analyses from other states. SCR control on SDI's reheat furnace is economically infeasible.

First, the cost effectiveness calculation provided by SDI was scrutinized and found to be credible and realistic. This cost effectiveness of $17,336/ton of NOx removed is far higher than has ever been considered feasible in any similar BACT analysis. Second, the SCR system proposed for SDI was compared specifically to Beta Steel. Three components not applied to the Beta Steel SCR control system explain the higher cost associated with the SDI SCR control system. These three components have been proposed to try to combat the operational problems associated with the SCR control system at Beta Steel and to address the increased variability of SDI's furnace. Third, IDEM also compared the proposed SDI cost proposal to similar reheat furnaces in other states. From this review it is clear that no other state has performed a more detailed and specific SCR analysis for a reheat furnace than IDEM has in this case. Further, the application of the SCR control technology on reheat furnaces in other states was dismissed due to either technical or economic infeasibility. In cases where a state considered the SCR control system on the reheat furnace as technically feasible, all economic evaluations demonstrated that the application of SCR was economically infeasible. This is consistent with the determination made by IDEM in the original BACT analysis and further supported by the refined SCR cost analysis submitted by SDI as part of this review.

B.1 Detailed SCR Cost Analysis for the Proposed SDI Reheat Furnace

Based on concerns presented by the Board in its June 22, 2000 Decision, additional cost information was obtained from vendors. The previous cost analysis utilized generic EPA OAQPS estimation factors, an accepted federal and state practice. However, to provide an even more detailed and supported cost analysis, actual vendor bids were obtained in lieu of many of the generic estimation factors. To start, SDI sought SCR bids from four well-known vendors. Only one, Huntington Environmental Systems (HES), was willing to bid. SDI then supported the other necessary capital and operation costs related to the SCRby providing detailed explanations of the costs, including vendor bids where available. The results of the more detailed cost analysis are summarized in the following table:

Vendor	% NOx Removal Efficiency	Cost/ton NOx Removed
Huntington Environmental Systems (HES)[15]	80	$17,336
Hitachi Zosen U.S.A. Ltd[16]	Refused to bid due to the technical implications associated with the large fluctuations in temperature and gas volume.	
Mitsubishi Heavy Industries America, Inc.		
Wheelabrator Air Pollution Control, Inc.[17]		

The detailed cost analysis based on the HES bid supports the original determination that the SCR control system is economically infeasible. The other three vendors solicited by SDI declined to bid due to the technical problems associated with the application of an SCR control system to the reheat furnace.[18] These concerns are supported by the continual technical problems encountered at Beta Steel in Indiana, the only reheat furnace in the country that has attempted to apply the SCR control technology. In addition, some BACT analyses have also removed SCR from the BACT review because it was determined to be technically infeasible. Since 1992, when Beta proposed SCR control, every permit decision for a steel mill has rejected SCR as BACT for a reheat furnace.[19]

B.2 Comparison of SCR on the Proposed SDI Reheat Furnace to the Beta Steel Reheat Furnace

Beta Steel proposed to apply the SCR control technology to the reheat furnace in its permit application submitted on December 12, 1991.[20] Because Beta proposed to install the system, no extensive BACT analysis was performed and no cost information was required. Therefore, the public record does not provide the information needed for a detailed cost comparison between Beta and SDI. However, because HES was also the SCR vendor for Beta, U.S. EPA requested that Beta's SCR components be compared to the design proposed for SDI. Thus, HES was asked to provide as much information as possible on Beta's design and specific components. HES explained that the SCR costs for the proposed SDI - Whitley County facility are greater than the Beta Steel costs would be because three additional components were necessarily proposed to handle the wide range of temperatures, flows and corresponding changes in NOx loading associated with the

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15 See Detailed Cost Information provided by Huntington Environmental Systems and SDI. (Attachment B-1)

16 Hitachi-Zosen was contacted at the suggestion of the Plumbers & Steamfitters Union, Local 166.

17 HES was a part of the same company as Wheelabrator at the time of Beta's SCR project. The combined company supplied Beta's SCR, and many of each company's current personnel were involved in the Beta SCR project.

18 See Letters from 3 different vendors declining to bid on SCR for the reheat furnace. (Attachment B-2)

19 Consistent with the Board's remand, IDEM also considered whether controls other than SCR would be feasible. As part of the July 7, 1999 permit decision, all but SCR and SNCR were deemed technically infeasible. Those findings were not appealed. After remand, SNCR was reinvestigated and found by vendors and the IDEM to be technically infeasible. (Attachment B-3) SNCR requires a higher furnace exhaust temperature than SCR and would create a significant amount of NOx just to heat the exhaust air before entering the SNCR. SNCR also has a much lower NOx destruction efficiency than SCR.

20 See revised Beta Steel permit application submitted on December 12, 1991, p. 12. (Attachment B-4)

operation of the reheat furnace.[21] These problems have continually plagued the operation of the SCR on the reheat furnace at Beta Steel, and as a result HES tried to eliminate these problems in its evaluation of SCR for SDI's reheat furnace.

One of the major components proposed for the SDI SCR system, but not applied to the Beta SCR system, is a feed-forward control system. The feed-forward design attempts to respond to changes in NOx load at the furnace outlet. In addition to the feed-forward ammonia control system, the SDI SCR control system will access the furnace control system via a data highway that anticipates changes in the furnace set points and tries to prepare the SCR's operation for periods of highly erratic process conditions. The SDI SCR system, unlike the Beta SCR system, also proposes a large refractory lined plenum/duct to allow for sufficient time to respond to changes in the process conditions. Refractory lining is required in lieu of fiber insulation to curtail catalyst particulate loading. These three component costs make up a significant portion (approximately 35 - 38%) of the total costs for the proposed SDI system, requiring the SCR control system to be significantly more costly at SDI than at Beta. HES also outlined a number of other design differences between the two systems.

In addition to the cost feasibility study between Beta Steel and SDI, it should be noted that the Beta Steel facility has had continual problems with the proper operation of its SCR system on the reheat furnace. Part of the problem is the wide variations in temperature and gas stream. This was already expressed by other vendors as discussed above and validated by the problems at Beta Steel. Although the three additional components of the SCR system at the proposed SDI - Whitley County facility have been proposed to try to combat the problems encountered with the SCR system at Beta Steel, there is no actual performance information to support that these three components will be able to meet the expected control efficiencies.[22]

The different furnace types create additional concerns. Beta Steel has a pusher type configuration while SDI proposes a walking beam type configuration. Walking beam furnaces can accommodate many more operational scenarios than a pusher furnace and have largely replaced pusher furnaces in the industry. A pusher-type furnace literally pushes a new piece of steel into the furnace, causing a piece of reheated steel at the other end of the furnace to be pushed out. This means that a pusher has higher hearth coverage from end to end than a walking beam furnace, which will have spaces between pieces of steel. A pusher will also have a more constant mass of steel inside the furnace at any one time, whereas the mass of steel in a walking beam can vary significantly. This is the most important variation between a pusher and a walking beam furnace because you can walk gaps into the furnace to distinguish between products and affect setpoint changes as the gaps go through the furnace. All walking beams have this characteristic, but pushers do not. Further, SDI's furnace has the additional ability to deep charge and deep discharge.

Deep Discharging is the immediate placement of a piece of steel far inside the furnace. Deep discharging is the immediate removal of a piece of steel before it would normally discharge from the

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21 See Letter provided by Huntington Environmental Systems outlining the differences between the Beta Steel SCR system and the proposed SDI SCR system. (Attachment B-5)

22 The cost/ton amount of $17,336 is for 80% NOx control. The HES bid is for 90% control or 1.0 lb/hr, whichever is higher. Under normal furnace operations, the 90% control efficiency would not apply because the NOx levels in the furnace exhaust will be too low. Thus, even if the SCR were working properly, 1.0 lb/hr of NOx in the SCR exhaust will often be the maximum level of control and will be less than 90% removal. IDEM notes that Beta has never achieved 80% control with any consistency. Further, other states have conducted BACT analyses using SCR control efficiencies of 50%-70%.

furnace. Deep charge and deep discharge add needed production flexibility, but create more furnace variability.

Further, Beta reheats fairly uniform steel slabs in its process. SDI will be a structural mill, which means that hundreds of different products will have to be made. Both blooms and beam blanks of varying sizes and weights will be used to make the different structural products. Heating characteristics of a beam blank are markedly different from the heating characteristics of a bloom. Frequent roll changes are required for the production of so many products. Also, the structural steel market itself dictates frequent roll changes in order for a mill to fill the relatively small tonnage orders of structural steel buyers. Beta's furnace is more variable than the typical industrial process which uses SCR control. SDI's furnace will be even more variable than Beta's.

The above analysis follows the criteria established in EPA's draft BACT guidance document.[23] According to the guidance, cost effectiveness is the key criterion to be used in assessing the economic feasibility of a control alternative. It further states that where a control technology has been *successfully applied* to similar sources in a source category, an applicant should concentrate on documenting significant cost differences, if any, between the application of the control technology on those other sources and the particular source under review. While Beta has not been successful in its SCR application, a comparison is nevertheless provided and shows that the SCR proposed for SDI is at least 35-38% more costly than Beta's components would be in today's dollars. Because the cost/ton for SDI is far higher than what is considered economically feasible, because SCR has not been successfully applied to similar sources in a source category (Beta Steel), because the costs associated with the SDI SCR system are significantly greater than the costs associated with the SCR system at Beta Steel and because the cost effectiveness analysis performed in this case is well supported and more detailed than any performed in other steel mill permits, SCR is not considered a feasible control alternative for the proposed SDI - Whitley County facility.

B.3 Comparison of SCR on the Proposed SDI Reheat Furnace to Other Reheat Furnaces

Although SCR has not been applied to any reheat furnace other than Beta Steel, the Board requested that IDEM review any additional cost information available from 5 of the 15 facilities discussed in the original BACT analysis performed as part of the documentation for the SDI - Whitley County permit.[24] The following table represents a summary of the cost information obtained from these facilities:[25]

Facility	Reheat Furnace NOx BACT Comparison Chart

[23] See EPA's March 15, 1990 Draft Document: "Top-down" Best Available Control Technology (BACT), p. 33-34. (Attachment B-6)

[24] See available SCR cost information for reheat furnaces from the list of similar sources stated in the NOx BACT documentation from Appendix B of the Technical Support Document to the SDI - Whitley County construction permit (CP-183-10097-00030). (Attachment B-7)

[25] A reheat furnace equipped with low-NOx burners is considered the baseline for BACT determinations on steel mill reheat furnaces. Conventional burners, which produce considerably more NOx than low-NOx burners, have not been installed in any recently-permitted reheat furnace. Thus, calculations for both incremental and average cost effectiveness would not be meaningful and are not required here.

	Control Applied	Other Controls Considered	Reason Rejected	Total Annual Costs	Cost Effectiveness
IPSCO Steel; IA	1996 - Low NOx Burners	**SCR**	**Cost Infeas**	**$655,442**	**$5,171/ton**
	2000 - Low NOx Burners	**SCR**	**Tech Infeas**	**---**	**---**
		SNCR - Exxon Thermal DeNOx	Tech Infeas	---	---
		SNCR - Urea Inj.	Tech Infeas	---	---
		FGR	Tech Infeas	---	---
Chaparral Steel; VA	Low NOx Burners	**SCR - Preheat**	**Cost Infeas**	**$628,123**	**$6,776/ton**
		SCR - Reheat	**Cost Infeas**	**$689,271**	**$4,477/ton**
		SNCR - Thermal DeNOx - Preheat	Cost Infeas	$338,501	$9,379/ton
		SNCR - Reheat	Cost Infeas	$424,303	$6,999/ton
		FGR - Preheat	Cost Infeas	$213,354	$9,459/ton
		FGR - Reheat	Cost Infeas	$267,353	$7,057/ton
		NSCR - SCONOx	Cost Infeas	$1,091,310	$4,393/ton
Nucor - Hertford; NC	Low NOx Burners	Comb Controls	Tech Infeas	---	---
		SCR	**Cost Infeas**	**$492,000**	**$3,100/ton**
		NSCR	Tech Infeas	---	---
		SNCR - DeNOx	Cost Infeas	$458,000	$4,148/ton
		SNCR - NOxOUT	Cost Infeas	$494,000	$3,835/ton
Nucor - Berkeley; SC	Low NOx Burners	Combustion Controls	Tech Infeas	---	---
		SCR	**Cost Infeas**	**not specified**	**$5,000/ton**
		NSCR	Tech Infeas	---	---
		SNCR - DeNOx	Cost Infeas	not specified	$4,900/ton
		SNCR - NOxOUT	Cost Infeas	not specified	$4,500/ton
Tuscaloosa Steel; AL	Low NOx Burners	**SCR**	**Cost Infeas**	**$670,000**	**$4,501/ton**
		SNCR	Tech Infeas	---	---
		EGR	Cost Infeas	$280,000	$3,574/ton

The cost estimates presented in the above table are estimates based on varying amounts of supporting information. Most agencies relied on the permit applicant's generic SCR cost estimate provided in the original permit application (e.g., Tuscaloosa; AL). A few applicants were required to obtain some basic cost information from actual vendors (*e.g.*, IPSCO; IA). Only one other mill actually obtained a vendor bid (e.g., Nucor-Hertford; NC), and that bid was based on vendor-assumed furnace characteristics and not on a reheat furnace's real-world variability. None are as detailed as the information presented by SDI. The cost bid from SDI is greater than the costs

described in the above table because, unlike others, SDI provided specific bid information to obtain a more detailed and accurate cost estimate of the SCR control system.

In addition, HES reviewed the operational problems associated with the Beta Steel facility which resulted in additional component costs to try to correct those problems and deal with SDI's more variable furnace. Because Beta Steel is located in Indiana and is regulated by IDEM, no other agency is in a better position than IDEM to analyze SCR and its application to a reheat furnace. Based on IDEM's firsthand experience of Beta Steel, IDEM finds the HES analysis of Beta to be reasonable and the different components included by HES in the SDI proposal to be necessary.

IDEM has reviewed all of the information obtained on both the technical and economic considerations associated with the real-world application of SCR on a reheat furnace. It is clear that SCR is not a feasible control option for the reheat furnace at the proposed SDI - Whitley County facility.

C REMAND ISSUE 3 - NOx AND CO BACT EMISSION LIMITS FOR THE EAF

IDEM must reconsider the BACT limitations chosen for NOx and CO emissions from the EAF. IDEM must explain why the limits it imposed are in lbs/hr (rather than in lbs/hr and lbs/ton, or lbs/ton alone), in particular explaining the differences (if any) between SDI's proposed mill and the fifteen similar mills that would justify exclusive lbs/hr limits for CO and NOx. Alternatively, IDEM is ordered to impose production limits in addition to the hourly limits for these pollutants.

Regardless of the fact that other recently issued PSD permits only require pound per hour emission limits for NOx and CO from the EAF, IDEM is revising the BACT emission limits in the SDI PSD permit to include pound per ton emission limits for both NOx and CO. This revision is consistent with the most restrictive requirements placed on other recently issued PSD permits. With respect to the initial stack test requirement, IDEM has consulted with U.S. EPA and has revised the initial stack test date for the EAF from 180 days to 365 days to be consistent with the requirements and information obtained from other states.

Because IDEM agrees to include production limits in addition to the hourly limits for both NOx and CO from the EAF, it has fulfilled the obligations of this remand issue and as a result no public comment period on the emission limits is required. The following information provides the rationale for IDEM's decision relating to the EAF emission limits for NOx and CO.

C.1 EAF BACT Review

The BACT review of the 15 sources originally evaluated was conducted to demonstrate that the most restrictive production-based limits for NOx and CO have been applied to the EAF at the proposed SDI - Whitley County facility. As part of the BACT investigation relating to the production-based limits on the EAF, the IDEM evaluated the initial testing requirements used to demonstrate compliance.[26]

C.1.1 EAF BACT Limitations

The following table represents the 15 sources evaluated in the original BACT review for the

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[26] See available permits, compliance stack test summary reports and other documented information relating to the 15 sources evaluated in the original BACT analsis for the EAF. (Attachment C-1)

proposed SDI - Whitley County facility. Unlike the original BACT table, which converted all emission factors to production-based "limits" for BACT comparison purposes, the following table provides specific limits required by the permits. Five of the 15 sources have only hourly-based limits, which is consistent with the limits required by the original permit for the proposed SDI -Whitley County facility. The following table is provided only for ease of reference. The emission factors used to set SDI's permit limits were not remanded and have not been changed.

No.	Facility	NOx BACT Limitations	CO BACT Limitations
1	Arkansas Steel, AR billets	1.0 lb/ton 50 lb/hr	6.0 lb/ton 300 lb/hr
2	Gallatin Steel, KY thin slabs	0.51 lb/ton 102 lb/hr	2.0 lb/ton 400 lb/hr
3	**IPSCO Steel, IA thin slabs**	**Current: 45 lb/hr Phase 1: 55 lb/hr Phase 2: 63 lb/hr**	**Current: 150 lb/hr Phase 1: 183 lb/hr Phase 2: 210 lb/hr**
4	*NUCOR - Berkeley, SC thin slabs, beam blanks & blooms*	*0.35 lb/ton 175 lb/hr*	*2.0 lb/ton 1000 lb/hr*
5	*Trico Steel, AL thin slabs*	*0.35 lb/ton 154 lb/hr*	*2.0 lb/ton 880 lb/hr*
6	*Tuscaloosa, AL thick slabs*	*0.35 lb/ton 56 lb/hr*	*2.0 lb/ton 320 lb/hr*
7	**Stafford Railsteel, AR blooms (not built)**	**64.4 lb/hr 261.2 tpy**	**287.5 lb/hr 1166.4 tpy**
8	Nucor Steel - Hickman, AR thin slabs	0.51 lb/ton 242.3 lb/hr	2.0 lb/ton 950 lb/hr
9	Nucor-Yamato, AR blooms and beam blanks	0.38 lb/ton 133.8 lb/hr	2.0 lb/ton 700 lb/hr
10	**Roanoke, VA billets**	**11/19/96: 8.4 lb/hr 30 tpy 11/6/98: 37.8 lb/hr 165.6 tpy**	**11/19/96: 95.8 lb/hr 342 tpy 11/6/98: 240 lb/hr 1052 tpy**
11	**Quanex -Mac Steel, AR round blooms**	**43.9 lb/hr 161.1 tpy**	**421.4 lb/hr 1547.4 tpy**
12	SDI-Butler, IN thin slabs	0.51 lb/ton 204 lbs/hr	2.0 lb/ton 800 lbs/hr
13	Qualitech, IN blooms	0.5 lb/ton	4.7 lb/ton
14	Nucor Steel, IN thin slabs	0.51 lb/ton	2.0 lb/ton

No.	Facility	NOx BACT Limitations	CO BACT Limitations
15	**Beta Steel, IN thick slabs**	**22.2 lb/hr**	**817 lb/hr**

Although five of the 15 recent BACT decisions for CO and NOx have applied only pound per hour limitations to the EAF (bolded typeface facilities in the above table), the IDEM has revised the BACT limitations for the EAF at the proposed SDI - Whitley County facility to include production-based limits for CO and NOx.

C.1.2 EAF Initial Stack Testing Practices for NOx

The following table summarizes compliance stack tests performed for similar facilities.

Facility	Began Operation	Initial Stack Test	Days until Test	NOx Emissions from EAF		CO Emissions from EAF	
				Compliance Test	Permit Limit	Compliance Test	Permit Limit
Arkansas Steel, AR	Awaiting information from ADEQ				1.0 lb/ton 50 lb/hr	Information not Available	6.0 lb/ton 300 lb/hr
Gallatin Steel, KY	4/95	1995	<180	Noncompliant with initial 1995 stack test (227.6 lb/hr) as well as the 1996 stack test (186.6 lb/hr)	0.51 lb/ton 102 lb/hr	Compliant	2.0 lb/ton 400 lb/hr
IPSCO Steel, IA	5/97	11/98	~545	Noncompliant with initial stack test (80 lb/hr)	45 lb/hr	Compliant (149 lbs/hr)	150 lb/hr
Nucor Steel - Berkeley, SC	*Awaiting information from SC DHEC*				*0.35 lb/ton 175 lb/hr*	*Information not Available*	*2.0 lb/ton 1000 lb/hr*
Trico Steel, AL	*N/A - Testing Not Required*				*0.35 lb/ton 154 lb/hr*	*N/A*	*2.0 lb/ton 880 lb/hr*

Facility	Began Operation	Initial Stack Test	Days until Test	NOx Emissions from EAF		CO Emissions from EAF	
				Compliance Test	Permit Limit	Compliance Test	Permit Limit
Tuscaloosa Steel, AL	*1/97*	*9/98*	*~600*	*Noncompliant with initial stack test (0.356 lb/ton), but in compliance with lb/hr limit (24.5 lb/hr)* *Compliant with retest conducted 1 month later (33.5 lb/hr and 0.349 lb/ton)*	*0.35 lb/ton 56 lb/hr*	*Noncompliant with initial test due to blockage in DEC Duct.* *Compliant with retest conducted 1 month later (136 lb/hr and 1.6 lb/ton)*	*2.0 lb/ton 320 lb/hr*
Stafford Railsteel, AR	N/A - Source Not Constructed				64.4 lb/hr 261.2 tpy	N/A	287.5 lb/hr 1166.4 tpy
Nucor Steel - Hickman, AR	3/31/91	Awaiting Information from ADEQ			0.51 lb/ton 242.3 lb/hr	Information not Available	2.0 lb/ton 950 lb/hr
Nucor-Yamato, AR	12/10/91	Awaiting Information from ADEQ			0.38 lb/ton 133.8 lb/hr	Information not Available	2.0 lb/ton 700 lb/hr
Roanoke Steel, VA	11/96	5/97	~180	No - out of compliance with initial stack test (19.1 lb/hr) Limit Relaxed	8.4 lb/hr 30 tpy	Compliant	37.8 lb/hr 165.6 tpy
Quanex - Mac Steel, AR	11/13/89	Awaiting Information from ADEQ			43.9 lb/hr 161.1 tpy	Information not Available	421.4 lb/hr 1547 tpy

Facility	Began Operation	Initial Stack Test	Days until Test	NOx Emissions from EAF		CO Emissions from EAF	
				Compliance Test	Permit Limit	Compliance Test	Permit Limit
SDI-Butler, IN	1/2/96	7/96	~180	Noncompliant with initial stack test (1.34 lb/ton) Noncompliant with second test 2 months later (0.612 lb/ton) Compliant with retest conducted once higher steel production rate was achieved	0.51 lb/ton	Compliant	2.0 lb/ton
Qualitech Steel, IN		9/99	~180	Compliant	0.5 lb/ton	Compliant	4.7 lb/ton
Nucor Steel, IN	*4/89*	*7/90*	*~450*	*Noncompliant with initial test (0.38 lb/ton), but in compliance with lb/hr limit (40.5 lb/hr, both furnaces)*	*0.35 lb/ton 28 lb/hr, each (2 furnaces) 122.6 tpy, each*	*Noncompliant with initial test (266 lb/hr)*	*29.0 lb/hr, each 126.8 tpy*
Beta Steel, IN	1/97	1/98	~365	Noncompliant with initial test (26.5 lb/hr)	22.2 lb/hr	Compliant	817 lb/hr

Each of the 15 facilities listed in the above table, with the exception of one, demonstrated noncompliance with its initial compliance stack test. Later testing, however, generally showed compliance with the permit limits.

Because of the unavoidable NOx compliance demonstration problems encountered by other sources, IDEM proposes the 365 day initial stack test period. Compliance with the initially higher limit (0.51 lb of NOx/ton) must be demonstrated through an initial stack test within 365 days. Typically, the facilities listed above did not perform compliance stack tests within the first year of operation.

A second NOx stack test must be performed within 540 days of operation to demonstrate compliance with the lower limit (0.35 lb NOx/ton). The proposed NOx stack test time frame for the EAF at the proposed SDI - Whitley County facility is more restrictive than those three facilities required to test for the same production-based limit of 0.35 pounds of NOx per ton.

C.2 IDEM Recommendations Relating to EAF Emission Limitations

Based on the above analysis, IDEM has revised the following conditions relating to the EAF to be consistent with the most restrictive BACT requirements as demonstrated in the discussion above (bold typeface characters represent additions to the original conditions of the permit and strikeout characters represent deletions from the original conditions to the permit):

D.1.2 Nitrogen Oxides (NO_x) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), the EAF auxiliary burners shall be limited to low-NOx/oxyfuel burners and NO_x emissions from the EAF shall not exceed the following:

(a) NO_x emissions from the EAF shall not exceed **0.51 pounds per ton of steel produced and** 102 pounds of NO_x per hour, **based on a three (3) hour block average** ~~as determined by the compliance test required in condition D.1.15~~. The Permittee shall demonstrate compliance with this BACT limit within the time period specified in condition D.1.15, item (a)(1). This BACT limit shall be applicable only until compliance with 0.35 pounds per ton of steel produced and 70 pounds per hour BACT limits are demonstrated.

(b) NO_x emissions from the EAF shall not exceed **0.35 pounds per ton of steel produced and** 70 pounds of NO_x per hour, ~~as determined by the compliance test required in condition D.1.15~~ **based on a three (3) hour block average**. The Permittee shall demonstrate compliance with this BACT limit within the time period specified in condition D.1.15, item (a)(2).

(c) If the Permittee applies for a permit modification to address the 0.35 pounds per ton of steel produced or 70 pounds per hour limits, IDEM, OAM, shall issue a final decision on such application within 120 days upon IDEM's receipt of the application.

D.1.8 Carbon Monoxide (CO) - Best Available Control Technology [326 IAC 2-2-3]

Pursuant to 326 IAC 2-2-3 (PSD - Control Technology Review; Requirements), CO emissions from the EAF shall be controlled by thermal oxidation and maintaining a negative pressure at the DEC air gap. CO emissions from the EAF shall not exceed **2.0 pounds per ton of steel produced and** 400 pounds of CO per hour, based on a three (3) hour block average.

D.1.15 Testing Requirements [326 IAC 2-1.1-11] [40 CFR 60.275a]

(a) (1) Pursuant to 326 IAC 2-1.1-11, the Permittee shall test for NO_x on the EAF within 60 days after achieving maximum capacity, but no later than **365** ~~180~~ days after initial start up, utilizing methods as approved by the Commissioner. This test shall be performed to determine compliance with conditions D.1.2, item (a).